

# THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—13TH YEAR.

SYDNEY: SATURDAY, FEBRUARY 20, 1926.

No. 8.

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### STILLBIRTHS AND EARLY INFANTILE MORTALITY.<sup>1</sup>

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THE question of infantile mortality has excited a good deal of interest lately both amongst the medical and lay members of the public. Largely owing to improvement in general education, in sanitation and hygiene and to the increase in our knowledge of the prevention and cure of infantile diseases, particularly diarrhoeal complaints, the death rate in infants has been considerably reduced in recent years, but it is a fact that the death rate of infants during the first few weeks of life has been altered very little, if at all, during the same period. It behoves us therefore to investigate the cause and to try to lower this still formidable rate. With this object in view I have studied the records of births occurring at the Royal Hospital for Women, Paddington, during portion of this year and as it is obvious that the causes of deaths in early infancy

are in most cases the same as those of the fœtus, I included stillbirths in my investigations. In order to obtain records of one hundred deaths where either the fœtus was stillborn or the child died during the first ten days of the puerperium, I had to peruse the records of 1,417 patients. This means that in about 7% of confinements the infant was either stillborn or died shortly after birth. By studying the histories of these patients I was able in most instances to form a fairly accurate opinion of the probable cause of death of either fœtus or infant.

I would like, however, to state that the details of the histories studied were usually not complete enough to enable me to draw any but the broadest conclusions as to the cause of death. Even when there is a very complete history of the confinement and a detailed account of any *post mortem* examination on the child, it is not always possible to state with accuracy the exact cause of death of the fœtus or infant. For example, in a case of *placenta prævia* it is sometimes impossible to determine whether the child died as the result of separation of the placenta or from the version to a breech presentation, which may have been performed as part of the treatment. In such cases I have considered that the primary cause of death was the *placenta prævia*. Hence this paper is merely an attempt to indicate roughly the

<sup>1</sup> Read at a meeting of the New South Wales Branch of the British Medical Association on November 26, 1925.

number of foetal and early infantile deaths, the result of the various complications of pregnancy and labour. The term stillbirth is one which has different meanings in different countries. In France and Holland the term stillbirth includes infants born alive who die during the first few days. Ballantyne<sup>(1)</sup> proposes to use the term "deadbirth" for a foetus born without any sign of life and "stillbirth" for a foetus which at birth has a heart beat and movement, but in which respiration has not commenced. However, as I have included infants as well as viable foetuses in my investigations, the distinction for the purposes of this paper is unimportant.

De Lee says that the highest mortality that befalls the human race in one day, occurs on the day of birth.<sup>(2)</sup> Schultze estimates that 5% of children are stillborn, dying during labour and 1.5% die shortly after birth; my figures confirm this estimate. The problem of lowering the death rate in the foetus and young infant must be attacked mainly through the parent, in most cases the mother and in a few the father.

It follows, therefore, that the lowering of mortality during the period under consideration is to be looked for in more thorough antenatal care and by more skilful treatment during delivery. If by these means a normal healthy child is born, which implies that the mother is also healthy and able to nurse the infant, there should be little need for any special care for the child.

Any disease or toxæmia which affects the pregnant woman, will likewise affect the foetus or infant.

There are certain diseases and malformations quite peculiar to the new born and others that affect him in common with older infants. Amongst the former are *icterus neonatorum*, the acute pyogenic infections, hæmorrhagic disease, hereditary syphilis, congenital atelectasis and certain malformations and deformities inconsistent with life beyond a few days. With regard to the diseases which affect young infants, but not as a rule after the first few weeks of life, we must remember that there is one avenue of infection, namely the umbilicus, which is responsible for many cases of septicæmia, peritonitis, pneumonia, tetanus and possibly other diseases. It might be well to consider whether there is any method except the time honoured one of dealing with the umbilical cord, such as canterization, which might lessen the number of infections from this source. On the other hand very young infants are frequently immune to certain infectious diseases, like diphtheria, measles and scarlet fever, although they sometimes occur in very young infants.

Pyelitis occurs sometimes in such infants; some years ago I removed a large pyonephrotic kidney from an infant, five weeks old, in whom the condition had followed on a pyelitis which had been present since the infant was a few days old.

I propose to review briefly some of the causes of foetal and early infantile deaths noted in the series which I investigated.

#### Eclampsia and Allied Conditions.

Under this heading I have included preeclamptic toxæmia and nephritic toxæmia. The latter condition frequently causes miscarriages early in pregnancy; but when pregnancy persists after the twenty-eighth week the infant is generally born prematurely and succumbs in a few days or else it is stillborn. Both these conditions cause a high death rate in both mothers and infants; in my series they were by far the commonest cause of death of the foetus or infant. They caused twenty-two deaths; seventeen of the infants were stillborn, five of these were macerated and five were born alive, but died within the first week of birth. The same toxin which is responsible for the trouble in the mother, no doubt sometimes kills the foetus. Infarcts, moreover, are commonly found in the placenta in the toxæmias of pregnancy and these would reduce the oxygenating area of the foetus and according to their number and size would lead to feeble and puny infants. It is remarkable how many living infants of eclamptic mothers suffer during the first week from mild convulsive attacks, somewhat resembling the seizures in the mother. It appears as if the same toxin was at work here also. I do not know whether any work has been done to determine whether these infants are more prone to albuminuria, which condition is not uncommon in apparently normal infants. According to De Lee<sup>(2)</sup> albuminuria is almost constant in new born infants for the first four to seven days. We sometimes see infants whose death is apparently hastened on account of giving the breast milk of the still toxæmic mother. It is, therefore, advisable to withhold the breast milk until the acute toxic phase has passed.

The death rate in infants of mothers suffering from eclampsia and allied conditions should be considerably lowered by more thorough antenatal care. Albuminuria is a condition which is easily recognized and in most cases amenable to treatment.

#### Ante Partum Hæmorrhage and Placenta Prævia.

*Ante partum hæmorrhage*, including accidental hæmorrhage and hæmorrhage from *placenta prævia* caused eighteen deaths in the series; twelve of the foetuses were stillborn and three of these were macerated. Of course, when a large portion of the placenta has been separated from the uterus, death of the foetus will result. It is probable also that there is a toxæmia underlying many of these cases, particularly cases of accidental hæmorrhage. Infarcts, moreover, similar to those seen in true toxæmia, are frequently met with in these cases and both of these conditions would be liable to cause either the death of the foetus or to its being born in such a feeble state that it would be likely to succumb during the first few days.

Here again, therefore, efficient antenatal supervision would result in fewer infants suffering from these conditions being seen. With regard to treatment at the time, it is difficult to believe how any other treatment than the recognized one would save many

babies in cases of accidental hæmorrhage. In *placenta prævia* Cæsarean section or the use of a de Ribes bag would probably save more infants than would treatment by version, but, of course, the life of the mother must always be the first consideration.

#### Dystocia.

Dystocia due to disproportion between foetal head and maternal pelvis caused nine deaths in the series. The danger to the child in these cases is in attempting to drag it through the pelvis by sheer brute force. It is in this condition that the postmature and other healthy infants are unfortunately lost.

It is in the mild degrees of contracted pelvis that the dangers are greatest. The accoucheur is tempted to have just one try and having put his hands to the plough, he imagines there is no retreat. There is no special skill required to deliver a dead and mutilated child through a slightly contracted pelvis, if the damage likely to be inflicted on the mother be ignored; force alone may accomplish this. In the severer degrees of contraction delivery *per vias naturales* is obviously impossible and Cæsarean section is done before any attempt at delivery has been made. The high forceps operation, particularly forceps on the floating head, is fraught with danger to both mother and child and should never be attempted by any but a skilled obstetrician. An attempt to bring about engagement by the use of forceps on the floating head is permissible under some circumstances, but the lives of many mothers and infants would be saved if the dangers of this operation were more thoroughly realized by the accoucheur.

Whilst not in any way desiring to minimize the dangers of the improper use of forceps, I believe that their frequent use is more often injurious to the mother than the infant.

There is no doubt that intracranial hæmorrhage frequently follows difficult forceps deliveries, but probably many of such hæmorrhages are as much due to a hæmorrhagic diathesis in the infant as to trauma.

How often patients are encountered in whom trauma has been excessive and yet the child progresses normally, never at any time showing signs of intracranial hæmorrhage, whereas other infants after spontaneous delivery frequently show signs of intracranial hæmorrhage and possibly hæmorrhages elsewhere. M. Warwick<sup>(3)</sup> found that among thirty-six routine autopsies performed on stillborn babies or those dying in early infancy, eighteen had suffered from hæmorrhages in the dura, over the brain or in the ventricles. Forceps had been used in one instance only. In eight of these infants hæmorrhages were found in organs other than the brain.

It is important to recognize the signs and symptoms of intracranial hæmorrhage if these infants are to be saved. Restlessness is a striking feature in many of these infants; they frequently have a peculiar, continuous cry. Twitching or actual convulsions are not uncommon; the respira-

tion is generally shallow and the infants are frequently cyanosed. Head retraction, general muscular rigidity, nystagmus and strabismus are sometimes seen.

When the hæmorrhage is supratentorial the fontanelle bulges and in the subtentorial cases lumbar puncture reveals dark blood-stained fluid. It is advisable, therefore, to perform lumbar puncture in suspected cases, both for diagnostic purposes and to relieve tension. The question of operation for massive hæmorrhages should be considered and undertaken if localizing signs are present. A blood coagulation test should also be undertaken and if the coagulation be delayed, injections of whole blood are advisable.

Holland<sup>(4)</sup> in his investigation of the cause of death of three hundred stillborn fetuses of viable age found that tears of the *dura mater* septa, generally associated with subdural hæmorrhage, were far more common than was generally believed to be the case. He found that out of one hundred and eighty-one fresh fetuses the *tentorium cerebelli* was torn in no less than eighty-one (44%); in many of these the tears resulted from apparently normal labour. The *tentorium* as a rule is torn near its junction with the *falx*. When the head is compressed in such a manner that there is a decrease in the antero-posterior measurement, as occurs in vertex presentations and with the aftercoming head in breech presentations, there is a compensatory increase in the vertical height. The *falx* being firmly attached to the cranial bones, its middle two-thirds becomes tense and stretched and the force is transmitted to the *tentorium* which is torn near its junction with the *falx*. Thus excessive head moulding is dangerous and may cause death either by producing intracranial pressure disturbances or by direct tearing of certain blood vessels. Holland found that the commonest site of hæmorrhage was from the tributaries of the vein of Galen and very rarely from the vein itself.

#### Hæmorrhagic Disease of the Infant.

On perusing the histories of the patients I found that the death of no less than five of the infants was attributed to hæmorrhagic disease. This number appears to me to be excessive, as many other cases of hæmorrhagic disease were encountered, but the patients were saved by prompt treatment. Hæmorrhages are found in different situations in young infants suffering from sepsis, jaundice and congenital syphilis and possibly in some they were due to one or other of these causes. Then again apart from the well recognized cases of subdural and visceral hæmorrhage due to trauma or acute congestion, there are others due apparently to a deficiency in the coagulability of the blood and therefore akin to hæmorrhagic disease. Several of the infants were premature and one frequently finds that premature infants show a tendency to hæmorrhage in different situations caused partly by a deficiency in the coagulability in the blood and partly by the thin walled blood vessels giving way



under slight trauma. Under these conditions the obstetrician is apt to be blamed for the hæmorrhage, whereas the real cause is in the child. With regard to the coagulability of the blood in young infants Rodda<sup>(5)</sup> found that the normal coagulation time is about seven minutes and that there is a steady increase in this time from birth to the fifth day and then a gradual diminution until the tenth.

#### Breech Births.

Breech births accounted for six deaths in the series. When breech presentation is recognized during the last month of pregnancy, provided there are no contraindications present, such as contracted pelvis or *placenta prævia*, it would be advisable in the interests of the child to perform cephalic version.

Autopsies on infants who have died as the result of breech birth, reveal the fact that tears of the *tentorium cerebelli* or *fals cerebri* are exceedingly common, due apparently to the rapid passage of the head through the pelvis. Of course, many breech births are also premature and this fact helps to swell the mortality rate.

Holland<sup>(4)</sup> in his investigations previously referred to demonstrated the astounding fact that in about 75% of the fresh stillborn fetuses which had been delivered by the breech, tears of the *tentorium cerebelli* were found and in the majority there had been subdural hæmorrhage also. It is quite obvious, therefore, that we shall have to make some radical changes in our methods of dealing with breech births.

#### Syphilis as a Cause of Death of Fœtus or Infant.

In my series three deaths were undoubtedly due to syphilis. I feel quite sure, however, that this number by no means represents the actual number of deaths due to syphilis. A routine Wassermann test had not been carried out with the serum of the mothers and there was no record of careful *post mortem* examinations on the infants. In my series of one hundred dead infants there were twenty macerated fetuses. A Wassermann test had been performed on ten of the mothers of these fetuses, but only two gave a positive reaction.

Wassermann and other serum tests are said to be unreliable during pregnancy and the early puerperium. De Lee states that even after reactions have been obtained the test must be repeated several times before accepted as a proof of syphilis and failure to react does not rule out the disease. Holland mentions two cases in which the spirochæte was found in the fœtus and in both instances the mother's blood failed to react to the test. I have myself seen an infant whose father had been treated for undoubted syphilis; the child born two years later was unquestionably syphilitic, but the mother's blood did not react. Holland found that forty-two of the three hundred stillborn fetuses examined by him were syphilitic.

De Lee found that 20% of the macerated fetuses born at the Chicago Lying-in Hospital were syphilitic. Whitridge Williams states that in his experience 80% of macerated fetuses are syphilitic.

The great discrepancy in the figures shows how difficult it is to be certain on the point. It is quite certain that syphilitic infants are often born of mothers who neither manifest the signs of active syphilis nor give any history of syphilis. A Wassermann test should certainly be carried out with the serum of all mothers of stillborn infants in order that we may get some idea of the incidence of this disease in pregnant women in this city.

#### Congenital Malformations, Deformities, Monstrosities.

One or other congenital malformation, deformity or form of monstrosity accounted for six deaths in the series. Many of these malformations are incompatible with life for more than a short time. Exomphalos or hernia into the umbilical cord is rare, but prompt operative treatment will save many of these infants. Some months ago I operated successfully on an infant in whom the whole liver and no portion of any other organ was present in the umbilical cord. This case was reported in THE MEDICAL JOURNAL OF AUSTRALIA of October 17, 1925.

Some years ago Dr. Cedric Bowker operated successfully a few hours after birth on a large umbilical hernia; a considerable portion of the bowel was present in the sac.

Dr. Frank S. Hone<sup>(6)</sup> states that he has seen several infants in whom syphilis seemed to be the cause of certain deformities. I have at present a child under treatment at the Children's Hospital with a clubbed hand and the child is a congenital syphilitic. Of course, it may be a coincidence in these cases, but my impression is that deformities are far commoner in syphilitic infants.

#### The Premature Infant.

There were thirty-eight premature infants in the series. A child born before the thirtieth week of gestation has very little chance of survival and with every week of gestation after this period the child's chances of being born alive and thriving improve about 10%.

This is a field in which much could be accomplished to improve the mortality rate. Special incubators or heated rooms should be provided in all large maternity hospitals. P. Cook<sup>(7)</sup> after reviewing the histories of seventy-seven premature infants, found that in sixty cared for in the old fashioned way by hot bottles and clothes basket, the mortality was 46.6% and in seventeen who had had the benefit of an incubator room the mortality was only 29%. It has been found also that if a premature infant is to have a reasonable chance of survival, it must get at least 50% breast milk. It is quite easy to secure the requisite amount of breast milk in a maternity hospital, but not always easy in private practice.

Abt finds that premature infants thrive best when the temperature of the room is from 21.1° to 22.2° C. (70° to 72° F.) and of the incubator 23.9° to 24.8° C. (75° to 76° F.).



TABLE.—RESULT OF INVESTIGATION OF PROBABLE CAUSE OF DEATH OF 100 INFANTS (65 WERE STILLBORN AND 35 DIED SHORTLY AFTER BIRTH).

Probable Cause of Death of Fœtus or Infant.	Fresh Stillborn.	Macerated.	Lying	Total.	Remarks.
1. Eclampsia and allied conditions .. . . .	12	5	5	22	30 (1 to 5) possibly required more efficient antenatal care
2. Severe anæmia and acute infections associated with high temperature .. . . .	1	1	1	3	
3. General peritonitis from ruptured appendix .. . . .	1	1	1	3	
4. Epilepsy .. . . .	2	1	1	4	
5. Syphilis in mother .. . . .	5	2	5	12	
6. Accidental hæmorrhage .. . . .	4	1	1	6	
7. Placenta prævia .. . . .	2	1	3	6	
8. Hæmorrhagic disease of infant .. . . .	3	0	1	4	24 (10 to 13) possibly required more skilled attention at the birth, although many of these were premature
9. Congenital deformities, monstrosities, anencephaly, etc. .. . . .	8	0	1	9	
10. Malpresentations and malpositions as face, brow, persistent occipito-posterior, etc. .. . . .	6	0	0	6	
11. Dystocia due to disproportion between head and pelvis, necessitating high forceps or craniotomy .. . . .	5	0	0	5	
12. Breech births .. . . .	4	6	7	17	5 of these were full-time fœtuses and 12 were either premature or macerated. Possibly the former required more skilled treatment at the birth and the latter more efficient antenatal care
13. Prolapsed cord .. . . .					
14. Cause not ascertainable .. . . .					

### Conclusions.

As a result of my investigations I have come to the conclusion that more infant lives are lost from maternal disease than from the complications of labour. Toxæmia associated with albuminuria and *ante partum* hæmorrhage, many cases of which are also associated with albuminuria, accounted for the greatest number of deaths. The number of infants dying as a direct result of childbirth is, of course, still far too large, but probably many of these infants would have died as a result of congenital debility or prematurity, even though no complication had existed at the birth. This applies particularly to breech births and prolapsed cord, both of which are far commoner with premature infants.

It is evident, therefore, that in order to save more infant lives we must direct our main efforts to the improvement of the health of the mother during pregnancy by the establishment of an increased number of antenatal clinics under the direct supervision of specially qualified doctors and nurses. There should also be prematernity wards in all obstetric hospitals, where the patients are under the care of an efficient staff of specialists in all departments working in cooperation with the obstetrician. In a meeting such as this it might well be discussed where the duties of the obstetrician cease and those of the other specialists come in. The pregnant woman is liable to all the ailments which affect her non-pregnant sister, together with others peculiar to herself and the same applies to the infant. If the obstetrician has piloted the woman safely through her pregnancy and confinement, there should seldom be any special care needed for the infant. Probably a greater saving of infant lives would result from a closer cooperation between obstetrician and physician than between obstetrician and pædiatrist. The adoption of the system in vogue in

some of the American hospitals, where the patients are visited periodically by a group of physicians and surgeons working in conjunction, would probably add considerably to the efficient working of the modern obstetric hospital.

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### CAUSATION AND PREVENTION OF MORTALITY DURING THE FIRST MONTH OF LIFE.<sup>1</sup>

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WHEN one comes to consider the causes of infant mortality in the first month of life, the most striking fact is that so little is known about them. Many deaths are due to prenatal conditions, such as toxæmias in the mother, malformations, injuries at birth and so on. Hæmorrhage, either intracranial or that form known as hæmorrhage of the

<sup>1</sup> Read at a meeting of the New South Wales Branch of the British Medical Association on November 26, 1925.

newly-born, is one of the more common causes. We regard the intracranial hæmorrhages as due to birth injuries, but what is the cause of *melæna neonatorum* and other hæmorrhages of the newly-born? *Post mortem* examinations disclose ulcers of the stomach or duodenum or massive intraperitoneal hæmorrhages and hæmorrhages into the liver or under the capsule, but they give us no indication of the underlying cause of these conditions. We know that in some infants, probably those with prolonged bleeding and coagulation times, the subcutaneous injection of whole blood will often control the bleeding and save the child's life, but beyond that we know nothing.

Pneumonia is not infrequently disclosed by *post mortem* examination when it has not been suspected during life, as in cases where the baby has been found dead in bed or when there are malformations such as diaphragmatic hernia. We must confess that many of the deaths which occur in the first month of life are non-preventible, at least in the present state of our knowledge.

Turning to statistics we find that in 1923 in New South Wales the infantile mortality rate during the first month of life was 30.3, that is half of the total infant mortality rate for that year (61.0). The rate for the first week was 22.8, showing what a large proportion die almost immediately after birth.

For the five year period 1919-1923 in New South Wales the infant mortality rate was 63.8 and of these deaths 23.5 were due to prematurity and congenital debility. Prematurity accounted for 17.2 and congenital debility for 6.3.

In 1923 the deaths due to prematurity numbered 917 and those to congenital debility 310, so that from these two causes alone New South Wales lost 1,227 babies.

Most of these deaths occur within the first month of life. Brend states that of 19.73 deaths per 1,000 births from prematurity which occur in the first year, 17.88 take place in the first month of life and it is probable that about the same proportion obtains in New South Wales.

It must be admitted that some of these deaths from prematurity are non-preventible, at least in the present state of our knowledge. It is also true that many are preventible and I think that it is not too much to say that at least half of the premature babies who now die, could be saved if proper care were given to them from the moment of birth.

The prevention of premature births is a problem of prenatal care, but many premature infants are born healthy and die from lack of proper care after birth.

Modern methods of treating the syphilitic pregnant woman can be relied on in almost every case to enable her to bear a healthy full-term infant. If more consistent efforts were made to detect syphilis in expectant mothers and to treat it effectively, some deaths of premature infants would be prevented.

In consideration of these facts I felt that the most useful contribution I could make tonight would be to give you the results of our experience at "Tressillian" of dealing with premature infants. In this series of premature babies, numbering fifty-six, thirteen were under 1,360 grammes (three pounds) on admission. Of these three died; two of these deaths occurred within twenty-four hours of admission, the other took place on the fourth day.

The age of two of these babies was one month on admission. One of these, whose birth weight was reported to be 567 grammes (one and a quarter pounds), weighed 1,190 grammes (two pounds ten ounces) in her clothes and was cyanosed, cold and moribund on admission. The other weighed 1,331 grammes (two pounds fifteen ounces) and did well.

The ages of the remaining eleven varied from twelve to eighteen days. The admission weight of twenty-one babies was between 1.3 and 1.8 kilograms (three and four pounds). Of these three died. The deaths occurred one day, three days and four days respectively after admission.

Seventeen babies on admission weighed between 1.8 and 2.3 kilograms (four and five pounds). Five babies on admission weighed between 2.3 and 2.7 kilograms (five and six pounds). There was therefore a total of fifty-six, with six deaths.

It was impossible to be sure of the foetal age of many of these infants, but as far as could be ascertained they varied from six and a half months to eight and a quarter months.

In going through the histories I noticed two points particularly, namely, that the rectal temperature of nearly every infant was considerably below normal on admission and that there had been a considerable loss of weight since birth in most of them.

#### The Body Temperature.

Fluctuations in temperature are greater than in the full-term infant.

Talbot and his collaborators from their studies of the metabolism in premature infants conclude:

That the heat production of these babies is very low when calculated on the basis of total production per twenty-four hours or per unit of body surface. On the basis of the theory as to the relation of heat production to body surface, one would expect the same heat production per unit of surface as in full-term infants; but they produce less heat and it is necessary for this reason to give the premature baby much more protection against heat loss in its period of prematurity than at any other period of infancy. The basal metabolism of the premature infant is lower than that of the full-term infant and remains so for at least three months. Even if the handicap of time is allowed, the premature infant produces less heat on his expected birthday than does the full-term infant during the first week of life.

These investigators believe that the amount of heat formed depends on the amount and tone of the active protoplasmic tissues and not primarily on the size of the surface of the body of these infants.

The relation which chilling of these small premature infants bears to the mortality is well shown by Budin in his book "The Nursling." In blue is shown the mortality of infants weighing two thousand grammes or less brought with depression

of temperature to the department for weaklings at the Maternité (98%). In red is depicted the mortality of infants weighing two thousand grammes or less born at the Clinique Tarnier where every precaution was taken to avoid chilling (23%).

The importance of protecting the premature infant from heat loss from the moment of birth is evident. The baby as soon as it is born should be warmly rolled up and placed in a prepared cot where the temperature is maintained at 32.2° to 35° C. (90° to 95° F.) by means of hot water bags. Only after some hours have elapsed should the baby be oiled and dressed in cotton wool or other suitable clothing, with a lined bonnet on its head. Varnot and Lavialle using a modification of the d'Arsonval calorimeter found that clothing has a great influence upon the heat loss by radiation and conduction from the skin. Thus a simple bonnet gave an actual saving of sixty-five calories a day.

The recent observations of Professor Louise Mellroy on the comparative loss of weight of full-term infants exposed to heat loss during bathing and of those kept clean by oiling, suggest that with premature infants also the initial weight loss will be less if every effort is made to conserve the body heat from the moment of birth. Not only should the bed be kept warm, the temperature being regulated by the rectal temperature curve, but the room in which the infant is, should be kept at a temperature of from 19.4° to 21.1° C. (65° to 70° F.). Premature babies should be kept in a room to themselves where the temperature can be kept even and good ventilation secured.

The baby's face should be exposed to the air of the room, so that it may have a plentiful supply of fresh air.

Hyperpyrexia may occur from an overheated bed. For instance, one infant weighing 1,360 grammes (three pounds) arrived at "Tressillian" with a temperature of 40.5° C. (105° F.), having been very carefully wrapped up and placed on a hot water bottle. This overheating, although undesirable, is not so disastrous to the baby as chilling.

If a premature infant has to be transported from one place to another, it should be placed in a properly prepared basket and carried in that way.

#### Feeding.

Human milk is almost more necessary for the premature than for the full-term infant. In this series all the babies received human milk whether from their mother or from a foster mother. The digestive organs are in such an undeveloped condition that the life of many premature babies depends on getting human milk. The difficulty of obtaining milk from the mother may be great, owing to the fact that the breasts are not as fully prepared for lactation as they are at full-term and to the fact that many premature babies are too weak to suck and do not stand the handling and exposure entailed in suckling.

In these cases the lack of knowledge on the part of those responsible of the artificial means of establishing lactation is often fatal to the infant. In most midwifery hospitals the premature infants may

be given breast milk from mothers in full lactation, but little or no attempt is made to establish the mother's milk. The baby is thus discharged from hospital on artificial food. A case in point is that of a young mother with premature twins. These babies were seen on their twelfth day and were being fed on a mixture consisting of two parts of fresh cow's milk and one part of water. They were having green and frequent motions, which was not surprising. In five days at "Tressillian" this mother's milk increased from sixty to four hundred and ninety cubic centimetres (three to twenty-three ounces). It can hardly be denied, therefore, that if this mother had had proper care and instruction during her twelve days in hospital, her babies would not have been exposed to the risks of artificial feeding.

Budin's instruction to his students might well be emphasized by every teacher: "First, save the baby, the essential point; second, save it in such a way that when it leaves the hospital, it does so with a mother able to suckle it."

These babies should receive water during their first twelve hours of life and then feeding with human milk should be begun. J. H. Hess considers that after the first few days the body fluids must be maintained by an intake of one-sixth to one-eighth of the body weight in fluid in twenty-four hours and this must include an intake of approximately thirty-two calories per pound (seventy calories per kilogram) after the first ten days of life. By the time the infant reaches an age of three to four weeks one-seventh to one-fifth of the body weight in milk can be given daily. At this time the water may be discontinued unless it is necessary to supply external heat of considerable degree or the infant has fever, both of which conditions necessitate increased amounts of fluids.

The amount of water considered necessary for the twenty-four hours should be measured and given either between feedings or used to dilute the milk.

In our series it was found that in the early days after admission of the smallest babies it was possible to administer only one-thirteenth to one-tenth of body weight in fluids. As the babies improved in strength by about the third or fourth week of age, they readily took one-fifth of their body weight.

The amount of milk given on admission varied according to the condition of the child from 3.5 to 15 cubic centimetres (one drachm to half an ounce) at a feeding. It is essential to begin with small quantities and to increase as rapidly as the condition of the baby permits. It is easy to increase the food, but if amounts too large for the baby's digestive powers be given, the disturbances which result, are difficult to deal with.

In the small infants eight to ten feedings in twenty-four hours were given. In some cases at two hourly intervals and in others at three hourly intervals. It is surprising to find that many quite small infants do better and take larger amounts of food if the longer intervals are used. As an example I may mention a baby weighing 1,673 grammes (three pounds eleven ounces), who when first able



to suckle took 202 calories when fed every three hours. He vomited several times a day; instead of reducing the amount of food, an interval of four hours was tried. The vomiting ceased and he took a larger quantity of food, namely 222 calories, the next day; he continued to do well.

The amount of food taken varied considerably with different babies. On an average babies between 907 and 1,360 grammes (two and three pounds) in weight began to gain regularly on about 110 calories per kilogram (fifty calories per pound), although individual babies began to gain on less. As they became stronger many of them took 155 calories per kilogram (seventy calories per pound).

Babies weighing between 1,360 to 1,814 grammes (three to four pounds) took from 110 to 132 calories per kilogram (fifty to sixty calories per pound).

The feeding of these babies is an individual matter and the amounts to be given can be determined only by careful and continuous observation.

#### *Method of Feeding.*

Few of these fifty-six babies were able to suckle when they were admitted. It is an interesting observation which has been made by Hess and others and confirmed by our experience, that some of these infants will suckle readily for a day or two after birth; they then become somnolent and manifest no inclination to suck. Whenever there is doubt as to the ability of the infant to suck, it should not be put to the breast. Most babies weighing under 1.8 kilograms (four pounds) will not stand the exertion nor the exposure and handling entailed in being put to the breast. At first they are fed with a medicine dropper to the end of which a small rubber tube is attached. The milk in this way is dropped into the mouth; the motion of swallowing is watched for and when this has taken place, and not till then, more milk is dropped into the mouth. As the baby gets stronger a Breck's feeder is substituted for the dropper and the baby is encouraged to suck. When it is strong enough and is able to preserve its body heat, it is put to the breast at first once or twice a day and later more frequently until it is receiving all its food directly from the breast. In the meantime the usual methods of stimulating the breasts are used and the milk is expressed by hand every three or four hours, so that when the baby is strong enough to suck, the breasts are secreting the milk required.

Many of the smaller infants of this series had to be tube fed, as the power of swallowing was not properly developed. The longest period during which this was necessary, was four days. Usually one or two tube feedings are all that are necessary; No. 12 French, No. 8 American or No. 5 English catheter is passed from ten to twelve and a half centimetres (four to five inches).

These small babies are handled as little as possible, being fed in their cots and oiled every second or third day. Although the less handling they have the better, it is necessary to alter their position in the cot and from time to time they are turned from one side to the other.

#### *Management.*

The difficulties met with in managing these infants arise from attacks of cyanosis, gastric and abdominal distension, infections and anæmia. The causes which operate in the production of attacks of cyanosis and periods of apnoea are the weakness of the respiratory muscles, the softness of the ribs, the underdevelopment of the centres of respiration and the presence of foetal atelectasis. Another cause is the aspiration of food into the larynx or trachea. The lack of development of the pharyngeal and laryngeal reflexes is responsible for the food reaching the air passages and the lack of reflex cough prevents its being ejected. Pneumonia may result from the aspiration of such foreign particles.

Distension of the stomach from overfeeding is one of the commonest causes of cyanosis and death in premature infants. Attempts at drinking are often followed by cyanosis. Undernourishment is given by Budin as a cause of cyanosis and he has shown that with increased feeding these attacks cease.

Unless immediate steps are taken to restore the respiratory activity to something like normal, the infant dies. After these steps have been taken it is necessary to supervise the feeding carefully in order to prevent recurrence.

Abdominal distension is not uncommon and is due to the weakness of the musculature. It may be caused by overfeeding. A small saline enema is useful in reducing it.

Three of the deaths in this series occurred from infections. One of the infants died within twenty-four hours of admission, one within forty-eight hours and the third died six days after admission. The mother of the last baby died of pneumonia which was the cause of the premature birth. On admission the baby had a severe naso-pharyngeal infection and pneumonia. All those who have much to do with premature babies, are emphatic concerning the need for isolation of these babies.

#### *Pritchard says:*

Their prospects of survival are immensely enhanced if premature infants are isolated in separate rooms, from which all visitors are excluded. So great is the danger from infection that it is almost impossible to rear premature infants in the general wards of institutions or hospitals.

In the prematurely born there is a distinct early hæmoglobin impoverishment of the blood, which reaches its maximum at about the third to the fourth month. While there is a distinct deviation from the normal of the hæmoglobin content the number of red cells is little below the normal and therefore the hæmoglobin content of the individual blood corpuscle is considerably less than normal. The cause of this hæmoglobin deficiency seems to be an insufficient iron content of the premature infant's blood, which is easily understood when we remember that the quantity of iron stored up by the foetus in the last third of pregnancy is twice as large as that during the first two-thirds.

The following are the blood counts of two of the babies in this series, one of which was born at six

and a half months and weighed one kilogram (two and a quarter pounds) and the other was born at seven months and weighed 1.1 kilograms (two pounds seven ounces) on admission.

The first baby at the age of three months had a waxy pallor and the blood count was as follows:

Red cells, 4,000,000.  
Total white cells, 7,500.  
Neutrophile cells, 15%.  
Eosinophile cells, 4%.  
Lymphocytes, 81%.  
Hæmoglobin value, 55%.  
Colour index, 0.6.

Some nucleated red cells were present.

This anæmia cleared up quite rapidly and in about six weeks the baby had a healthy colour.

The second blood count is that of an infant who when seen at eight months old had the same waxy pallor:

Red cells, 4,000,000.  
Total white cells, 7,500.  
Neutrophile cells, 26%.  
Lymphocytes, 67%.  
Transitional and large mononuclear cells, 5%.

There was a considerable decrease of hæmoglobin in the red cells. Anisocytosis and some poikilocytosis were present. There were no nucleated red cells nor abnormal white cells.

On the administration of saccharated oxide or carbonate of iron in powder form as recommended by T. W. Hill, these conditions of anæmia cleared up rapidly.

#### Prognosis.

J. H. Hess says in connexion with the future of the premature infant: "There is not the slightest doubt but that the premature infant born of healthy parents, who is without congenital deformity and who survives the first few days of life, is entirely capable of complete and perfect development."

The table given here confirms this. These seventeen infants have been seen within the last few weeks and all show good mental and physical development. There is a tendency for them to remain light in weight and short in length, but this tends to be equalized later.

#### Remedies.

The following are some of the means by which the present high mortality rate of premature infants and weaklings may be reduced:

1. In the course in pædiatrics given to the medical student stress should be laid on the fundamentals of infant hygiene and infant feeding. Students should be taught the details of the care and handling of these babies. They should be prepared to recognize and overcome the special difficulties which arise in the first few weeks of life. Thorough teaching, both theoretical and practical, in the methods of establishing lactation during the period of time when the infant is unable to suck, should be given. The facts that all healthy premature babies given proper care from the moment of birth can be saved and that experience shows that it is worth while to save these babies, should be impressed upon them.

2. Every midwifery nurse should receive as part of her training instruction in what is known as mothercraft, that is methods of handling, feeding and caring generally for the newly-born infant, the methods of establishing lactation when difficulties occur and special teaching in the care of the premature baby.

3. Provision should be made in every maternity hospital for a properly equipped room for the treatment of premature infants and for special nurses to care for them. These infants require constant individual care and the attention of a nurse night and day until they are strong enough to be treated as full-term babies. The feeding of these infants is often a slow and tedious process. The attacks of cyanosis and apnœa which not infrequently occur, require immediate attention, otherwise the baby may be found dead in bed. Abdominal distension must be watched for and relieved. In fact there are many details of care which must be carried out, if the baby is to survive and which can be carried out efficiently only by one whose whole time is given up to the infant.

I wish to thank Dr. Gordon Tait for allowing me to make use of the notes on the premature babies which have been under his care.

TABLE.

Number.	On Admission.		Later Examination.			General Physical Condition.	Mentality.
	Length (Cm.).	Weight (Grammes).	Age (Months).	Weight (Kilos.).	Length (Cm.).		
1 .. ..	—	992	48	14.0	91.4	Good	Normal
2 .. ..	—	1,800	40	13.15	93.3	First tooth at six months; walked at twelve months	Normal
3 .. ..	—	1,729	40	12.64	92.7	The same as 2.	Normal
4 .. ..	49.6	2,511	15	10.78	76.2	First tooth at six months; walked at thirteen months	Normal
5 .. ..	45.7	1,814	12	9.07	73.7	First tooth at seven months; crawled at eleven months	Normal
6 .. ..	55.9	2,155	6	7.17	—	Good	Normal
7 .. ..	50.8	1,814	6	7.11	—	Good	Normal
8 .. ..	50.8	2,030	8½	7.08	69.9	Good	Normal
9 .. ..	41.9	1,743	7½	4.54	62.3	—	Normal
10 .. ..	45.0	1,666	10½	10.33	72.4	Two teeth; good	Normal
11 .. ..	—	2,012	10	7.94	68.6	Good	Normal
12 .. ..	48.3	1,906	10	8.19	69.0	Good	Normal
13 .. ..	49.5	1,628	6	6.69	61.0	Good	Normal
14 .. ..	53.3	1,715	6	6.35	61.0	One tooth; good	Normal
15 .. ..	—	1,127	15	8.39	76.2	Eight teeth; good	Normal
16 .. ..	36.8	985	5	3.57	50.8	Good	Normal
17 .. ..	41.9	1,024	4½	4.40	59.7	Good	Normal

## Reports of Cases.

### CEREBRAL TUMOUR.<sup>1</sup>

By WILFRED EVANS, M.B., Ch.M. (Sydney),

Honorary Assistant Physician, Sydney Hospital, Sydney;

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#### Clinical History.

THE patient is a male, aged fifty-six years. His father died at the age of seventy-five years from senility. He had, however, suffered from some mental disease before his death. The mother died from "blood poisoning." Two sisters and two brothers are alive and well. Some two and a half years ago the patient was treated for some heart condition in Sydney Hospital. He gave a history of moderate alcoholism and suffered from pneumonic influenza in 1918.

About two and a half years before his admission to hospital the patient noticed that he was becoming deaf in the right ear. This has gradually progressed and the deafness in the right ear is now complete. Two years ago hearing in the left ear became impaired and this impairment has progressed slowly so that at the present time he is quite deaf in both ears. With the onset of deafness the patient complained of a ticking noise mainly in the right ear. This was not continuous and is now but rarely heard. At the time when he was treated for heart failure the patient was suffering from attacks of giddiness. These have been present intermittently ever since, although he has been free from this during the past two weeks. The patient vomits occasionally, vomiting began three months ago and has lately become worse. Vomiting is not related to food.

About six weeks ago his eyesight began to fail. The sight of the left eye first became impaired. He could not see objects on the left. Now he is unable to read. When walking along the street he is apt to collide with people on the left side. While walking he feels uncertain of his steps; he tends always to deviate to the left. He does not fall.

During the past two months the patient has complained of headaches. He states that he wakes up in the morning with severe headache which passes off later in the day.

The patient's intellectual functions and cranial nerves, save for the seventh and eighth, are normal. The second cranial nerves manifest no definite change in regard to acuity of vision and colour sense and there is no optic neuritis, but the fields of vision are considerably affected. He has complete right homonymous hemianopia, that is absolute loss of vision in the temporal half of his left eye and the nasal half of the right eye. No reaction is obtained to Wernicke's hemianopic test; in other words, the pupil reacts to light thrown on it from the blind side. Examination of the eighth nerve on both sides reveals almost complete nerve deafness, but this was apparently preexisting and can hardly be connected with the present illness.

Slight but definite weakness with some spasticity is present in the left arm and leg and the patient walks on a wide base, tending always to deviate to the left. Rombergism is also noted and definite adiodokinesis in the left arm. Sensation to pain and to variation in temperature is normal, but there is a slight dulling of tactile sensibility in parts of the left arm and leg. The appreciation of passive position and movement, size, shape and form and the vibration sense are all very much affected on the left side and definite ataxia is present.

The left knee jerk is exaggerated. Ankle clonus and slight patella clonus are present on the left side. The right knee jerk is normal. The plantar reflex is extensor in type on the left side, but of the flexor type on the right. The organic reflexes are normal.

The cardiac apex beat is situated in the sixth intercostal space 11.25 centimetres (four and a half inches)

from the middle line. A pulsation is present in the sixth interspace and in the epigastrium, it is systolic in time. A systolic thrill is present. On percussion dullness is present in the fifth intercostal space to a distance of 8.75 centimetres (three and a half inches) from the middle line. The second sound at the mitral area is loud and booming. A mitral systolic murmur is audible. Systolic murmurs are heard at every orifice. The pulse rate is seventy-five in the minute. The pulse is regular in force and time, the force is good, the volume is large and the tension low. Visible pulsation is present in the peripheral arteries. Slight oedema is seen over the tibiae.

On examination of the lungs the vesicular breath sounds are found to be diminished at the apices posteriorly and a few fine crepitations are audible at the left base. The alimentary system is normal. The kidneys are neither palpable nor tender and the urine is clear. The hæmopoietic system is normal. The blood has not reacted to the Wassermann test.

#### Comment.

The intense headaches and increasing vomiting, together with the focal nerve symptoms, even in the absence of optic neuritis point very definitely to cerebral tumour. The interesting combination of right homonymous hemianopia with spastic paresis and disturbance of deep sensibility on the left side suggest a lesion of the brain at the point where the right optic tract on radiation meets the crossed sensory tracts ascending from the left side of the body, that is in the neighbourhood of or just behind the right thalamus and this is supported by absence of response to Wernicke's hemianopic test. This indicates that the lesion in the optic tract is situated behind the *corpora quadrigemina*, as there is no interruption in the circuit of the light reflex. The patient, however, does not exhibit the over-response to affective stimuli which is so characteristic of thalamic lesions.

#### Post Mortem Notes.

The patient subsequently died and a *post mortem* examination was carried out on September 8, 1925.

The pericardium was normal. The mitral valves were much thickened, no lesion was discovered on the aortic valve. Congestion of the liver was found.

The cerebro-spinal fluid was not increased in amount. A tumour was demonstrated in the right occipital lobe. Adjoining the tumour was a cavity filled with straw-coloured fluid. The tumour extended forward towards the thalamic region. The cavity was possibly a dilated portion of the posterior horn of the lateral ventricle.

### TORSION OF THE EPIDIDYMIS AND SPERMATIC CORD.

By THOMAS HAMILTON, M.B., Ch.M. (Sydney),

Medical Superintendent, Newcastle Hospital, New South Wales.

E.H., a coal-trimmer, aged twenty-one years, was admitted to hospital complaining of a painful swelling of the right testicle. He stated that six days previously while descending a ladder he had suddenly missed his foothold and had had to make a violent muscular effort to retain his hold. On reaching the bottom he was seized with a sickening pain in the right groin, but managed to continue his work for the rest of the shift.

On returning home he had a hot bath which gave him temporary relief, but as the pain returned next morning and the testis became slightly swollen he remained in bed for five days. The swelling on the fifth day became much larger, red and tender and he was immediately sent into hospital. There was no previous history of venereal disease and no urethritis was present.

On examination the patient was a well-nourished young adult and both testes were fully descended. The right testis was swollen to double the normal size and was very tender on palpation. The details of the swelling were

<sup>1</sup> The clinical history of this patient was read at the meeting of the New South Wales Branch of the British Medical Association on August 13, 1925.



obscure, but it was circular and firm and did not involve the inguinal portion of the spermatic cord.

Torsion of the testis was diagnosed and he was operated on under general anaesthesia. I cut down on the spermatic cord by the usual route. On delivering the testis into the wound I found that it was covered by recent adhesions and acutely engorged, being very tense and bluish-purple in colour. Freeing of the parietal layer of the *tunica vaginalis* revealed a torsion, consisting of one complete turn at the junction of the spermatic cord and the tail of the epididymis and a half-turn twist of the *cauda epididymidis* itself. The latter condition was rendered possible by the fact that the *cauda* was not attached to the body of the testis in the normal way, but was quite mobile within the cavity of the *tunica vaginalis*.

The testis was also abnormal in that the visceral layer of the *tunica vaginalis* did not dip into the digital fossa except for a small portion of its length near the head of the epididymis. Detorsion being impossible, I excised the testis and the patient made an uneventful recovery, leaving hospital fifteen days after admission.

#### Comment.

Unusual features in this case are the probable origin of the condition during a sudden muscular effort, the length of time elapsing before the onset of acute engorgement of the testis and the abnormal anatomical freedom of the *cauda epididymidis*. Fagge, of London, believes that torsion is practically impossible in a normal adult testis.

Uffreduzzi<sup>(1)</sup> believes that before torsion can occur there must be an abnormal attachment of the testis and a capacious *tunica vaginalis*. He believes further that torsion of the spermatic cord is always produced by abnormal contraction of the cremasteric fibres and that the site of the twist is always the free portion of the cord which is covered by *tunica vaginalis*.

The case reported appears to lend support to his beliefs.

It may be noted in passing that the case is also an interesting one from the viewpoint of industrial compensation.

#### Acknowledgment.

I am indebted to Dr. S. S. Gardiner for permission to take charge of the patient and to Dr. A. B. K. Watkins for his help in photographing the specimen.

#### Reference.

- (1) "Medical Annual," 1921.

### Reviews.

#### IMMUNITY.

D'HERELLE has followed up his work on the bacteriophage by a presentation of his views on immunity based on the phenomenon of bacteriophagy, an English translation of which appears under the title of "Immunity in Natural Infectious Disease."

<sup>1</sup> "Immunity in Natural Infectious Disease," by F. d'Herelle; Authorized English Edition by George H. Smith, Ph.D.; 1924. Baltimore: Williams and Wilkins Company. Royal 8vo., pp. 400. Price: \$5.00; post paid.

The reader is prepared by the translator to meet some revolutionary ideas in the book. In a preface he states: "Needless to state this new concept of the mechanism of immunity involves a radical modification of some of the theoretical ideas which have hitherto dominated immunologic thought. . . ." The reason for this radical modification is given by the author in a foreword in which he states that almost all preexisting views of immunity are based upon "artificial" experiments. The study of the reactions has been carried out on laboratory animals with bacteria to which these animals are refractory and the author adds that immunology—or such as is usually designated by the name—is the study of "immunity in artificial infectious disease." "Only a study of the natural disease as it prevails among animals naturally susceptible can lead to a knowledge of acquired immunity."

The first part of the book is given to the study of the reactions of living matter and deals firstly with the origin of specific reaction. A long description of physico-chemical properties and their relations to life results in the writer drawing conclusions that it is impossible to regard any action taking place within the living being, without taking account of the colloidal state "which intervenes in every one of the intimate phenomena of life."

All reactions taking place in the living being owe their characteristics to the colloidal state which alone is compatible with life. Immunological reactions must then necessarily be reduced to colloidal reactions which may be divided into two categories. The first are those tending to the maintenance of the colloidal state, that is to the conservation of life. These are the specific reactions of immunity—prophylaxis. The second are secondary phenomena which affect the miscellar stability and tend to destroy the colloidal state. These are the reactions of contrainimmunity—anaphylaxis. Under these secondary phenomena d'Herelle classes those reactions, hitherto regarded as reactions of immunity, which result in the formation of agglutinins, precipitins and complement fixation bodies. These reactions are discussed in the second part of the book dealing with

the reaction against inanimate agents. By consideration of the similarity of the phenomena of agglutinin formation with that of the flocculation of colloids under the influence of either electrolytes or other colloids, their relation to colloidal reaction is pointed out.

Flocculation which includes precipitation and agglutination, is ascribed as being in all probability a property of the colloids of serum resulting from a modification of the colloidal equilibrium brought about by the presence of a foreign colloid.

In the phenomena mentioned d'Herelle sees no connexion with an act of defence on the part of the body against bacteria. "This hypothesis contra-indicated by facts has been abandoned." Similarly the formation of complement fixing bodies is explained not as a reaction of defence, but as being due to modifications of the colloidal state. Indeed d'Herelle strongly refutes the claim that any bacteriolysin can exist, such terminology being part of "the history of an error" due to the "magic of words." In effect "the final result of the antigen-antibody reaction



Figure Showing Specimen Described by Dr. Hamilton. A = Hydatid of Morgagni; B = Digital Fossa; C = Fold of *Tunica Vaginalis*; D = Swollen Body of Testis; E = Half Turn Twist of Epididymis; F = Mobile *Cauda Epididymidis*; G = Site of Twist at Junction of Cauda and Cord.

whether revealed as precipitation, agglutination or fixation of complement is always a flocculation. There is but a single antibody which provokes always the same phenomenon—a coagulation."

Then follows an interesting discussion of the principles involved in anaphylactic shock. The relation of this to an unstable state of equilibrium of the blood colloids is indicated, the main factor in the causation of the condition being the liberation of free hydrogen ions which occurs with the reaction of antigen and antibody with a consequent modification in the equilibrium of the cellular gels in the direction of a coagulation of protoplasm.

Summing up his views d'Herelle concludes that the so-called antibodies, that is precipitins, agglutinins and complement fixing bodies, are not reactions of defence against bacteria. They function solely as a reaction of colloids upon colloids.

Antibacterial reactions are necessarily accompanied by these colloidal reactions, resulting in anticolloid antibodies which are in reality anaphylactic principles and therefore contraprotecting principles. These may be disastrous for the organism in which they take place. "Antibodies can only be considered as the fatally expensive price of immunity."

The third part of the book deals with the reaction against animate agents, that is bacteria. It provides an intensely interesting study.

In considering the question of infection d'Herelle emphasizes the distinction between transmissible diseases, such as tuberculosis and contagious diseases, such as plague, cholera and so forth. With regard to the latter group he points out that though the organism apparently causing the disease is in many cases known since infection can be produced by artificial inoculation, yet the disease so produced is not contagious. He therefore sees the necessity of adding a fourth to the three postulates of Koch. This is "that the experimental disease should be as contagious as the natural disease." This condition d'Herelle regards as the principal one governing experimental disease, for it alone is sufficient to demonstrate the rôle of the supposed agent. Without it the three points laid down by Koch can only lead to error since they may incriminate as morbid agents organisms which are merely associated forms.

Of the defensive reactions against bacteria by the living organism d'Herelle states there are but two whose reality is proved—phagocytosis and the production of antitoxins. He admits the possibility of there being other endogenous means of defence, but is satisfied that of endogenous causes phagocytosis alone explains all natural immunity which characterizes the refractory state, while acquired immunity can be sufficiently explained by the production of antitoxin. The latter is used in its broad sense of substances capable of neutralizing toxic bacterial products. Such neutralization renders the bacterium inoffensive and phagocytosis may then exercise itself.

In addition to these endogenous means of defence an exogenous immunity exists in the form of an ultra-microscopic organism—the bacteriophage which occurs in the bodies of all animals and is parasitic of bacteria causing their lysis. The action of this ultra-microscopic agent in immunity is threefold. It has a direct action, the bacteriophage intervening directly to destroy pathogenic bacteria which attempt to invade the body. It has an indirect action caused by the opsonic power of the lysed bacteria which stimulates phagocytosis and leads to the establishment of organic antibacterial immunity. It has a further indirect action due to the lysed bacteria being in a physical and chemical state such that they react on those cells of the body which produce antitoxins and so initiating the establishment of organic antitoxic immunity.

D'Herelle replies briefly to some criticisms which have been levelled against bacteriophage as the explanation of transmissible bacteriolysis.

He credits those critics who explain the phenomenon as being due to a principle derived from the bacterium, with the discovery of "a true phenomenon of suicide in perpetual series."

The last section of the book is given to a description of the ultraviruses and their place in infection and immunity.

D'Herelle's conclusion is that in all really contagious diseases the actual agent of contagion may be an ultravirus, the nature of the disease depending on the secondary infecting agent—the bacterium. Immunity against the ultravirus protects against epizootics, though sporadic cases of infection may occur. Many diseases produced artificially by inoculation of "so-called" specific agents are not contagious. On the other hand all diseases experimentally produced by an ultravirus are just as contagious as the natural disease. "This fact is adequate to prove that the ultravirus is the specific agent."

Immunity to the ultravirus is of cellular origin resulting in the production of a principle which possesses the power of inactivating specifically the infecting virus. Because of their stability these inactivating principles must be "not properties resulting from an equilibrium, but substances analogous to but not identical with the antitoxins."

D'Herelle's final conclusion is that there is but one specific reaction in the process of immunity.

Whether it be represented by the reaction of the endothelial cell to the stimulus of a toxin miscella or a protein miscella—either animate or inanimate—whether it be the reaction to a pathogenic ultravirus or whether it be the bacterium reacting to the excitation caused by the bacteriophage, there is in all cases an inactivation of the exciting principle through the intermediary of a flocculating principle elaborated by the cell. The response is single not multiple, whether the product be termed sensitizin, antitoxin or antivirulin and it is always a "flocculin." The results of this single mode of reaction are of two types, one tending to conservation of the unstable equilibrium which means life, the other tending towards the rupture of the equilibrium. The specific reaction is a physico-chemical reaction. The conservation of life may be a result just as death may be a result of the reaction, but the aim of the latter is not the conservation of life.

D'Herelle has certainly opened up some new lines of thought and in the light of these some preconceived ideas of immunity may eventually be discarded. Whether D'Herelle's views will be accepted remains to be seen.

It is at times rather hard to follow his logic and the fact that the book is a translation makes this no easier. The book suffers from needless repetition, but for originality of idea and for its probably important bearing on immunological problems is well worthy of attention.

#### A TEXTBOOK OF OPERATIVE SURGERY.

MR. H. W. CARSON'S book on operative surgery covers the whole range of general surgery and some of the special branches and this in fifteen hundred pages.

It is, however, difficult to find a subject which is not dealt with in it. Needless to say the book has to be very concise and the reader must appreciate that often it is the personal opinion of the writer of the chapter which he is reading and that other surgeons may hold different views on the subject. However, in most cases the "pros" and "cons" are concisely listed.

Certain chapters stand out. The one on bone repair operations is well up to date and full of detail. The one on breast cancer contains a good description of permeation and that on cleft palate is original and the method is described by the author as heterodox.

One feels that this is a work on operative surgery rather for the student and the teacher than for the practising surgeon. The latter cannot expect to find in a book of this size guidance in the rarer technical details.

As in many recent surgery books pathology and physiology have to a great extent been divorced from the practical side and must be sought in other books. In spite of this the book promises to be of the greatest use in the schools and indeed will make most interesting reading for men in general practice.

"Modern Operative Surgery." Edited by H. W. Carson, F.R.C.S. (England); Volumes I. and II.; 1925. London: The Waverley Book Company, Limited. Sydney: Angus & Robertson, Limited. Royal 8vo.; Volume I., pp. 784, with 367 illustrations; Volume II., pp. 784, with 374 illustrations. Price: 75s.

## The Medical Journal of Australia

SATURDAY, FEBRUARY 20, 1926.

### Public Health Experts.

THE ROYAL COMMISSION ON HEALTH was required to examine and report on the measures to be adopted to bring about a "cooperation of the Commonwealth and State Health authorities." In the chapter of the report devoted to this part of the reference, there are paragraphs dealing with the public health experts and with chairs of preventive medicine and tropical hygiene. The Royal Commissioners express the opinion that "a greater number of experts highly trained in public health is needed in Australia." They state that the existing facilities for training these experts are very inadequate and should be increased.

It will be remembered that in 1919 six prominent medical practitioners met at the invitation of the Editor of THE MEDICAL JOURNAL OF AUSTRALIA for the purpose of examining the whole question of medical education. The committee probed the matter to the bottom and did not start to build up a practical curriculum until a solid foundation had been discovered. Their report was published in THE MEDICAL JOURNAL OF AUSTRALIA of March 27, 1920, pages 299 to 302. Among the recommendations contained in the report was one that there should be three professors to organize the teaching of the fundamental sciences and three professors to organize the teaching of the ultimate sciences. Of the latter a professor of preventive medicine was demanded. Nearly six years have passed and nothing has been done to meet this demand. In the course of these six years hygiene and preventive medicine have advanced rapidly. Ideas and conceptions which were nebulous at that time, have taken shape; new doctrines have been established and have been given place in the syllabus. The medical profession has been approached with the proposal that each member should contribute to the wellbeing of the community by undertaking some tasks at the bidding of the health authorities. Curative medicine is becoming progressively less

important; preventive medicine is claiming an increasing amount of attention. It will be necessary in the future as in the past for medical practitioners to treat patients and to endeavour to cure disease. But this activity of the medical practitioner will become restricted, while more and more of his energies will be taken up in the struggle to gain mastery over preventable disease.

If this reform is to bear fruit, it is essential that there shall be a sufficient supply of experts in hygiene and preventive medicine. Later, no doubt, every general medical practitioner will be required to possess a relatively wide knowledge of modern hygiene. That a school of hygiene must be established at once is admitted. The Royal Commissioners make this demand in direct language. Whether one modern school will suffice for the needs of Australia at the present time is open to argument. The Royal Commissioners advocate at the present juncture the establishment of one school in the University of Sydney. They deem it advisable that the Commonwealth Department of Health should include a sufficient number of highly trained experts to assist local health authorities when requested by the State health authorities and they indicate that a large number of competent medical officers should be attached to the Federal Health Council and to the Laboratory and other branches of the Commonwealth Department of Health. In addition teachers will be required for the modern school of hygiene. It appears that while one school might suffice for the immediate needs of Australia, the question of the expediency of establishing two or three schools cannot be lightly brushed aside. The Royal Commissioners find that the arguments put forward in favour of the selection of the University of Sydney are convincing to them. It may be found that the Universities of Melbourne and Adelaide will be prepared to provide admirable facilities for the modern training in preventive medicine. Both these universities have demonstrated within recent years that they are progressive institutions and need only to be freed from reactionary control to advance into the van of the medical educational forces.

The modern school of hygiene differs fundamentally from the old school of public health. The



achievements of the past have been gained as a result of the control of the water supply, the introduction of sewage disposal and the supervision of building structure. The science of epidemiology has not been exploited to its full extent and the possibility of attacking disease by immunological and biochemical means has scarcely been taken into account. There is no essential difficulty in the organization of an up-to-date school of hygiene nor should the planning of a curriculum be beyond the power of the experts in preventive medicine now in Australia. The first professor must be a man with extensive knowledge, a wide vision and sufficient imagination to make provision for the next ten years. He must be both learned in the scientific aspects of his specialty and awake to the practical application of accumulated data to everyday problems. He must keep in touch with the practising portion of the medical profession and insist on an entire emancipation of hygiene from political control. The sooner the school is established, the better it will be for the safety of Australia.

### Current Comment.

#### THE MONOCYTES IN TUBERCULOSIS.

THE percentage of large mononuclear cells present in the blood of a normal individual has been shown by Fairley to be in the neighbourhood of 4.5. The so-called transitional cells are generally grouped with the large mononuclear cells or monocytes. Many authorities regard them as the older form of the latter cell and according to some both cells arise from the endothelial lining of special areas of the blood vascular system. Fairley stated that in all probability the monocytes are identical with the clasmatoocytes of connective tissue.

The occurrence of a leucopenia in tuberculosis is commonly recognized and has been used for diagnostic purposes. It has been left, however, for Dr. R. S. Cunningham, Dr. F. R. Sabin, Dr. S. Sugiyama and Dr. J. A. Kindwall to investigate the blood picture in this disease and interpret their findings from the aetiological point of view.<sup>1</sup> They have confined their attention chiefly to the monocyte and while some of their conclusions are to a certain extent speculative, their findings are of absorbing interest. In the first place they discriminate between the monocyte and the clasmatoocyte. They refer to the findings of some of the authors that the phagocytic cells can be separated into two distinct strains, clasmatoocytes and monocytes. These workers held that the former are derived

from endothelium and constitute what have been called endothelial leucocytes or endothelial phagocytes. They refer to their previous work<sup>2</sup> which they regard as supporting this view. On the other hand, it is claimed on evidence presented by another group of the authors that the monocyte does not arise from endothelium, but in common with the other white cells from the reticular cell, a primitive embryonic rest. Dr. Cunningham and his collaborators also claim that morphological and physiological differences have been manifested by the use of the so-called vital and supravital staining methods. Clasmatoocytes are characterized by the large size of the foreign bodies which they ingest, by their power of agglutinating such material and by the fact that the ingested material is distributed in the cytoplasm in a manner wholly devoid of pattern. When the monocytes are stained by the supravital method a constant and characteristic pattern is produced. Certain fine bodies that stain with neutral red, occur in a rosette around the centrosphere and the presence of this rosette limits the zone for the storage of absorbed material to the periphery of the cell. Sabin has shown by the supravital technique that there are two types of substances in the living monocytes that react to neutral red. There are tiny bodies arranged in a rosette around a clear spot, the centrosphere and larger bodies in the periphery of the rosette. The latter are in the opinion of Dr. Cunningham and his collaborators true vacuoles of digestion, comparable to the vacuoles of the clasmatoocyte. They found that in the reaction of the monocytes to tuberculosis the fine bodies of the "rosette" increase in enormous proportions and that the monocytes undergo an evolutionary process resulting in the production of epithelioid and giant cells.

Dr. Cunningham and his collaborators carried out experimental observations on a series of seventy-five rabbits. In the majority of instances an organism of bovine tuberculosis was used and in some cases an organism of human tuberculosis. Intravenous (occasionally intraperitoneal) injections of an emulsion were given and the dosage was controlled as far as possible by microscopical examination and counting. Daily blood counts were made over a series of six to seven weeks. They recognize that the series is small, but point out that with the number of workers available more extensive observations were impossible. For differential blood counts the supravital technique was used and autopsies were controlled by careful studies of body tissues prepared by the supravital method. The immediate effect on the monocyte of the ingestion of the tubercle bacillus is an inhibition of the motility of the cell. This loss of motility was regarded as a sign that the cell had been damaged. At the same time as the cells lost their motility the number of stainable vacuoles in the periphery round the rosette was increased. This change is regarded as open to three possible explanations. Either it is evidence of increased activity on the part of the cell or evidence of cellular injury or

<sup>1</sup> *Bulletin of the Johns Hopkins Hospital*, October, 1925.

<sup>2</sup> Cunningham, Sugiyama, Maximow and Herzog.

it is an indication that the cell is attempting to compensate by increased cytoplasmic activity for an actual damage to its structure. The next effect of tuberculosis on the monocyte consists of two things, the suppression of the vacuoles which are normally present in the periphery of the cell, and a characteristic and extensive multiplication of the fine particles of the rosette. This is the beginning of the formation of the epithelioid cell. It was found that when a cell or other particulate matter was ingested by the monocyte, it was always to be seen in stained "vacuoles of digestion." When tubercle bacilli were found in the monocytes, they were not situated in stained vacuoles and no signs could be seen indicative of digestion of the bacilli. The bacilli were seen "several times" in living cells. It was thus assumed as "most reasonable" that the bacilli in the monocytes remain alive and capable of multiplication. This is stated as being one of the factors justifying the suggestion that the bacilli are harboured by the monocytes instead of being destroyed by them. It will be remembered that it has been shown that anthrax bacilli may multiply in mononuclear cells and become extruded. The last phase of the epithelioid cell tends either towards fatty degeneration or towards giant cell formation. Droplets of fat may form and go on increasing until they obscure the rosette and the nucleus of the living cell. It has been shown that monocytes have a tendency to divide by amitosis, a condition in which nuclear division precedes division of the centrosome. Complete amitosis involves three consecutive processes, nuclear division, division of the centrosome and division of the cell. It is thus suggested that owing to inhibition of division of the centrosome giant cells are formed from monocytes. The giant cell of tuberculosis has all the appearance of having come from a monocyte. The rosette, characteristic of the monocyte, is enormously enlarged and is centrally placed, so that the multiple nuclei are confined to a peripheral zone.

In discussing their findings, Dr. Cunningham and his collaborators state that they regard it as clear that infection with tuberculosis brings about an increase in the number of reticular cells. They are not prepared to say whether the change of the monocyte into the epithelioid cells is initiated by some chemical substance produced by the infection, which affects the cell structurally and permits bacilli to enter it and live in it more easily, or whether these changes are initiated by the presence of bacilli within the cell or by both methods. They express themselves as sure that the major effect of tuberculosis in the body is on one strain of cells, the monocytes. They hold that the monocyte is primarily damaged by the infection and that it subsequently becomes the host to the invading organism. In other words "tuberculosis is a disease of the monocytes."

This is a new conception of tuberculosis and if it can be proved as correct, will have far reaching effect from every point of view, particularly that of immunity. Dr. Cunningham and his collaborators

think it quite probable that the fact that the organisms of tuberculosis can live as a parasite in a monocyte, may mean that the bacillus is thereby protected to some degree from the usual reactions of the body against it. The failure to obtain an effective immune serum may be the result of the intracellular nature of the infection and therefore may not indicate a fundamental inability of the tissues to produce sufficiently powerful antibodies. Confirmation of their findings in animal tissues and records of observations in the case of tuberculous lesions in human beings will be awaited with interest. More particularly will it have to be determined what effect other organisms have on the blood cells in question in the production of a mononucleosis or monocytosis. Dr. Cunningham and his collaborators have found monocytes develop into epithelioid cells in Hodgkin's disease. Moreover, if the reaction of the monocyte to the tubercle bacilli is shown to be specific, it will be necessary to determine what concomitant and essential pathological changes, if any, are brought about in the tissues of the invaded and infected individual.

#### HIRSCHSPRUNG'S DISEASE WITH OPTIC ATROPHY AND OLD CHORIOIDITIS.

HIRSCHSPRUNG'S DISEASE is generally regarded as a congenital condition. As a rule constipation is a prominent feature. Dr. C. Worster-Drought has recently reported a case which occurred in a child eight years of age.<sup>1</sup> She first came under treatment when five years old on account of faulty vision. Subsequently abdominal distension occurred and this was associated with increase in appetite and wasting. Dilatation of the colon was present on X ray examination. It was of the type commonly seen in Hirschsprung's disease. No constipation was present, but attacks of diarrhoea occurred occasionally. No palpable masses were discovered and no tenderness was found. Internal strabismus was present on the left side and the right eye contained an anterior polar cataract. The serum and cerebro-spinal fluid of the patient and her parents were submitted to the Wassermann test and no reaction was obtained. The cerebro-spinal fluid of the child was normal in all respects.

Dr. Worster-Drought expressed the opinion that in all probability the association of Hirschsprung's disease with the abnormalities in the eye was accidental. He thought that the case supported the view that Hirschsprung's disease is not congenital and that constipation is by no means a necessary symptom. Syphilis was excluded in his opinion by the response to the various tests.

Dr. F. Parkes Weber did not agree that the association between the conditions was a casual one. Hirschsprung's disease according to him is a congenital abnormality of development and when one congenital abnormality is present, a search will sometimes reveal others in the same child. The ocular lesions in the patient were in his opinion largely if not altogether congenital.

<sup>1</sup> *Proceedings of the Royal Society of Medicine*, December, 1925.

## Abstracts from Current Medical Literature.

### PHYSIOLOGY.

#### Abdominal Pressure and Diuresis.

It has been shown that baths cause diuresis and that the diuresis appears to be dependent on the water pressure over the abdomen and not on variations in temperature. J. Q. Griffith and H. R. Hansell (*American Journal of Physiology*, September, 1925) have endeavoured to determine whether abdominal pressure maintained by any other method could also give rise to diuresis. Pressure was applied over the whole of the anterior surface of the trunk by means of a rectangular rubber bag which could be inflated with air so as to give different pressures. The pressures used was either ten or twenty-five centimetres of water. A diuresis analogous to that obtained in baths occurred upon the application of suitable pressure to the abdomen. The evidence would seem to indicate that there is an optimum pressure for producing diuresis, different for different individuals and that the more nearly the applied pressure approaches the optimum pressure, the greater the diuresis. Too high pressures may cause partial suppression. The explanation is probably to be sought in increased venous pressure.

#### Circulation in Static and Dynamic Exercises.

In ordinary forms of muscular exercise one of the chief factors concerned in the return of the blood to the right side of the heart is the propulsive action of the muscles. H. L. White and R. M. Moore (*American Journal of Physiology*, August, 1925) have made observations on the circulatory response to a form of exercise in which this action of the muscles was not present. For the static exercise the two legs were held in a horizontal position unsupported for a period of ten minutes. Frequent records were taken of the blood pressure, pulse rate, venous pressure and respiration rate before and after the exercise. The immediate effect of a strong isometric contraction of a large proportion of the muscular tissue of both extremities is presumably to squeeze out a large part of the blood. In other words the circulatory bed is suddenly decreased without a corresponding decrease in the amount of circulating blood. The immediate effect of this factor should tend to increase both arterial and venous pressure. The venous pressure usually, but not invariably exhibits a moderate rise (two to four centimetres of water) during exercise. The maximum of this rise is usually not attained at once. On cessation of the exercise the venous pressure falls at once to the resting level. The pulse invariably manifests a significant rise. The systolic pressure rises considerably during

exercise, sometimes immediately, more often progressively and the fall to normal after exercise is quite rapid. Diastolic pressure is variable. Apparently the increase in the volume of the blood contained in the venous system is taken care of by a compensatory process. In another series of experiments dynamic exercises were performed, the nature of the exercise being half an hour's work on a bicycle ergometer at different rates of working. As a result of the two sets of experiments the authors state that the data warrant the conclusion that the tendency of the increased venous return during exercise to raise the venous pressure is partially or completely compensated by the venodilator mechanism, the increased aspiratory action of the thorax, the increased heart rate and the loss of diastolic heart tone. It appears probable that the variability of the compensatory response in different individuals is due principally to variation in the extent of diminution of diastolic heart tone. The experiments on static exercise afford evidence that the pumping action of the skeletal muscles is not an essential factor in bringing about an increased venous return. The pressure in the great veins in the thorax may rise above atmospheric pressure during exercise.

#### The Surface of Red Blood Cells.

JEAN OLIVER and L. BARNARD (*American Journal of Physiology*, July, 1925) have attempted to determine the nature of the cell surface of red blood corpuscles by some experiments on the electrokinetic properties of cell suspensions. A red cell when suspended in a fluid reacts in regard to its electrokinetic properties as if it possessed a surface of globulin. A surface of either pure albumin or lipid would not explain these reactions. The electrolyte concentration of the suspending fluid determines whether the red cell suspension reacts like a suspensoid; in higher concentrations (0.9% sodium chloride) it reacts like an emulsoid. These properties of the red cell suspension can be explained by the current theory of colloid stability according to which two factors operate to produce stability, the electrical potential at the interface of the particle and the suspending medium and the forces of attraction between the suspending medium and the particle. In the red cell suspension it has been demonstrated that variations in the solubility of a globulin surface in the suspending fluid account for the differences in the mechanisms which cause the stability noted as the electrolyte concentration of the suspending fluid is changed.

#### Blood Pressure and Altitude.

R. CRUCHET (*La Presse Médicale*, November, 1925) has studied the effects of variations of the atmospheric pressure on arterial blood pressures in conditions such as would be found in aviation. Subjects were examined in a chamber in which the air pressure could be rapidly raised or lowered to correspond to various heights

above the earth. The pressure could be reduced at such a rate that a pressure corresponding to a height of five thousand metres could be reached in fifteen minutes. Both the diastolic and the systolic pressures rose progressively during the decompression, as also did the pulse rate. With recompression there was often some lag, then the pressures fell towards normal, but there were always somewhat higher systolic and diastolic pressures when the atmospheric pressure reached normal than at the beginning of the experiment. When the pressure was increased above atmospheric the blood pressures and the pulse rate fell. When the subjects were fatigued, the blood pressures did not rise so high as with fresh subjects on decompression and fell to a greater extent on recompression. If the subject breathes oxygen in certain proportions mixed with air when the arterial pressures have become raised owing to a reduction of air pressure, the blood pressures rapidly sink to normal and the respiration is greatly relieved. The symptoms associated with aviation sickness also disappear almost completely when oxygen is breathed.

#### The Physiology of the Spleen.

A NUMBER of researches carried out in the Cambridge laboratory have pointed to the conclusion that the spleen has a definite function which is after all but the expression of the two chief features in the structure, namely the muscular character of its framework and the extravascular condition of the red blood corpuscles which it contains. The function may be briefly described as that of acting as a reservoir for erythrocytes. J. Barcroft, H. A. Harris, D. Orshovats and R. Weiss (*Journal of Physiology*, October, 1925) have investigated the function of the spleen from this point of view, using a new technique. A number of surgeon's metallic sutures were placed round the edge of the spleen of an animal and the animal allowed to recover. X ray photographs were taken of the spleen after various procedures. From the photographs flat lead models were made and the size of the spleen estimated. It was found that the normal spleen is usually much larger than that of the dead animal. In the case of hæmorrhage the living spleen in the dog, cat or rabbit is two, three or even five times the size of that in the dead animal. In the earlier stages of hæmorrhage the spleen contributes an amount of material to the circulating blood approximately equal to that of which the hæmorrhage deprives it. During exercise also the spleen expels its contents into the circulation in a considerable degree. Estimates in the cat and dog show that in exercise the shrinkage of the spleen corresponds to 6% to 15% of the blood volume. The spleen then appears to function in adjusting the volume of circulating blood to the needs of the animal, the spleen acting, so to speak, as a "bank" for red corpuscles.



### Blood Pressure During Sleep.

THE onset of sleep according to the vasomotor theory is due to the fatigue of the vasomotor centre, with a resultant diminution of cerebral circulation. C. Landis (*American Journal of Physiology*, August, 1925) has studied the circulatory changes in sleep as afforded by tracings of the blood pressure obtained by the Erlanger method. As the subject went to sleep it was found that the pressure gradually dropped from approximately one hundred and ten millimetres of mercury systolic and seventy-four millimetres diastolic to ninety-four millimetres systolic and sixty-eight millimetres diastolic. The pulse rate also falls. There is generally a uniform pressure rhythm during sleep. When the awakening was sudden, the pressures rose rapidly from the sleep level. The decrease or increase of blood pressure is closely concomitant to the loss or regaining of consciousness in the sleep process. Sleepiness either before actually starting to go to sleep or after awakening is not associated with a relatively lower pressure. The weight of evidence suggests that the circulatory changes are resultant rather than causative. Bodily position has no effect on the blood pressure during sleep.

### BIOLOGICAL CHEMISTRY.

#### Effect of Heat on Cod Liver Oil.

H. W. SOUTHWATE (*Biochemical Journal*, July, 1925) has made some experiments upon the effects of high temperatures on the accessory food factors present in cod liver oil. In the first experiment a sample of cod liver oil has been heated to 300° C. at a pressure of 0.2 millimetre of mercury, six hours being occupied by the heating process. The oil has been cooled in the absence of air. This oil has been fed to rats in amounts of one gramme daily. No evidence of the presence of the growth factor has been obtained. Further X ray examination of the bones has shown that the calcifying principle has been destroyed by heating the oil. In the second experiment three samples of cod liver oil have been heated to 200° C. for periods of one, two and four hours, an arrangement being employed to exclude air. Tests upon rats have shown that five milligrammes of the unheated oil restored normal growth which had ceased on the basal diet. About forty milligrammes of cod liver oil heated for one hour and one hundred and eighty milligrammes of oil heated for two hours have been required for the same purpose. Over three hundred milligrammes of oil heated for four hours failed to produce normal rate of growth. No rat has developed xerophthalmia when given oil heated for four hours. The bones of the rats have been examined radiographically and their calcium content has been measured after death. The radiograms reveal equal

calcification in the bones of rats given unheated oil and oil heated one hour. Some osteoporosis has been seen in the bones of the rats given oil heated for two hours. Calcification has been, however, more pronounced in the bones of the rats given oil treated for four hours than in the bones of rats given the basal diet alone. The results of the calcium estimations bear out, on the whole, the results of the radiographic examinations. The author concludes that oxidation from external sources is unnecessary for the destruction of the antirachitic and growth promoting factors of cod liver oil and that in the absence of external oxygen these factors are fairly stable to heat.

#### Glutathione in Blood.

H. F. HOLDEN (*Biochemical Journal*, July, 1925) has made a study of the optically active substances other than glucose in sheep's blood and has brought forward evidence of the occurrence of glutathione. A white powder has been obtained by treating the protein-free filtrate with mercuric sulphate and by separating that part of the precipitate thrown down by phosphotungstic acid. The final product has been precipitated by alcohol. This powder contained both "neutral" sulphur and amino-nitrogen. After reduction it gave the reactions of a sulphide. Upon hydrolysis it yielded crystals of glutaminic hydrochloride. The yield has been fifty milligrammes per litre of blood. No trace of the substance has been found in sheep's plasma. Other experiments indicate that this substance is present in the blood corpuscles of the goat, rabbit and rat in the reduced form. In the course of this research it has been noted that glutathione converts metahæmoglobin into oxyhæmoglobin and reduces the latter to hæmoglobin *in vitro*.

#### Colour Reaction for Vitamin A.

O. ROSENHEIM AND J. C. DRUMMOND (*Biochemical Journal*, July, 1925) describe a delicate colour reaction for the presence of vitamin A. The test is carried out by adding one cubic centimetre of pure arsenic chloride to one drop of cod liver oil and shaking the tube. A brilliant ultramarine blue colour appears which changes in a few seconds to a purple tint and gradually fades. A well defined absorption band extending from  $\lambda$  550-590 persists for about five minutes. The reaction is extremely sensitive. It has been obtained in dilutions of one in one million. The fact that the chromogenic substance resists saponification and is concentrated in the cholesterol-free unsaponifiable fraction of cod liver oil suggests its relationship to vitamin A. The chromogenic substance can be distilled in a nitrogen atmosphere, but is destroyed by oxidation in a slow current of air. The reaction makes it possible to differentiate the growth promoting vitamin A from the antirachitic vitamin D. The authors

hope to use the intensity of this coloration as a test of the evaluation of content of vitamin A. From a study of the chemistry of other substances giving this colour reaction the authors draw attention to the hypothesis that vitamin A is a sterol derivative.

#### Glucose in Blood.

J. A. MILROY (*Biochemical Journal*, July, 1925) has devised a new method for estimating the amount of glucose in blood. Its advantages are claimed to be simplicity and the absence of need for a colorimeter. The method depends on the fact that nitroanthraquinone sulphonates are reduced when heated with glucose to hydroxylamine derivatives with a green colour and finally to an amine derivative with an intense red colour. The proteins are precipitated with tungstic acid. The diluted filtrate is treated with reagent, made up to constant volume and heated in a water bath. The colour is compared with the colours of a set of standard tubes containing known quantities of glucose and treated in a similar manner. While the method is not of great accuracy, the speed and simplicity are regarded as advantageous. The comparison of colours should not be delayed as the colouring matter separates. At least one cubic centimetre of blood is required for an estimation.

#### Antineuritic Yeast Concentrates.

H. W. KINNERSLEY AND R. A. PETERS (*Biochemical Journal*, July, 1925) have endeavoured to prepare more concentrated preparations of vitamin B and to measure the activity of these preparations. They state their results in terms of torulin activity. The figure for torulin activity is obtained by dividing the number of days' protection after cure observed in pigeons by the weight in milligrammes of the dry preparation and multiplying the result by one hundred. An account is given of a lengthy method of concentration whereby a product has been obtained which represents an increased activity of roughly one thousand times. Doses of this concentrate which protected pigeons against polyneuritis for many days, have not caused any increase in weight after cure of the polyneuritic symptoms.

#### The Activation of "Insulin" by Albuminous Bodies.

F. BERTRAM (*Klinische Wochenschrift*, June 4, 1925) experimented with albuminous bodies in an attempt to activate "Insulin" injections. He used the preparation "Caseosan" in his work. A mixture of "Insulin" and "Caseosan" caused a definite increase and prolongation of the effect of "Insulin." When "Caseosan" alone was used there was no effect noted on the blood sugar curve of diabetics. If "Insulin" and "Caseosan" were injected separately, the latter had no effect on the "Insulin."



### British Medical Association Scholarship and Grants.

Correspondence between the Federal Committee and the parent Association concerning the best means of facilitating applications by members of the Association in Australia for science scholarships and grants was read. It was agreed that the prescribed application forms could be sent to the Honorary Secretary of the Federal Committee and that these forms together with advice from the Committee concerning the suitability of the applicant could be forwarded to the offices of the Association in London.

### Proposed International Society of Medical Practitioners.

The Honorary Secretary read a letter from the Medical Secretary of the British Medical Association, intimating that at the time of the opening of the new house in Tavistock Square, five delegates of foreign medical organizations had met informally in his office to discuss the proposal to inaugurate an international society of medical practitioners. As a result of the discussions a letter of invitation was drawn up by Dr. F. Decourt and this letter had been sent to the presidents and secretaries of representative medical organizations in various countries. Dr. A. Cox pointed out that he had not had an opportunity of laying the proposals before the Council of the British Medical Association, as the printed copy of the *lettre ouverte* had been received just before his departure for South Africa. The object of the proposed society was to serve as an international bureau of information. When any member desired information concerning any matter affecting medical practice or medical practitioners in any country he would make his wishes known to the secretariat who would pass on the information as soon as it was received and a copy would be filed for future reference. The matters that might be dealt with, would include legislative measures affecting the medical profession, such as medical registration acts, public health acts, national health insurance acts, workmen's compensation acts and similar measures, arrangements in connexion with friendly society lodge practice, industrial medical work, life insurance work and the like, the measures adopted to safeguard the interests of medical practitioners engaged in the medical services and other matters of a medico-political or medico-ethical nature. It was pointed out that the organization would be an inexpensive one, since it would be unnecessary to appoint a council or committee. All that would be required, would be a secretary and a small clerical staff in a properly equipped office.

It was resolved that the proposals be submitted to the Branches and that a summary of the open letter of invitation in English translation be prepared for this purpose.

### Australasian Medical Congress (British Medical Association).

In accordance with the regulations of Congress (Regulations 7 and 9) the Executive Committee of the Australasian Medical Congress (British Medical Association), Second Session, Dunedin, 1927, requested the Federal Committee to invite certain distinguished persons to become Patrons and others to become Vice-Presidents of Congress. Invitations had therefore been addressed to Lord Stonehaven (Governor-General of Australia), General Sir Charles Fergusson (Governor-General of New Zealand), Admiral Sir Dudley de Chair (Governor of New South Wales), Earl of Stradbroke (Governor of Victoria), Sir G. T. M. Bridges (Governor of South Australia), Colonel Sir William Robert Campion (Governor of Western Australia), Sir James O'Grady (Governor of Tasmania), the Honourable J. H. P. Murray (Lieutenant-Governor of Papua), the Honourable Eyre Hutson (Governor of Fiji), Dr. John Macmillan Brown (Chancellor of the University of New Zealand) and Dr. T. K. Sidey, M.P. (Chancellor of the University of Otago). The invitations in each instance had been accepted. His Excellency the Governor-General of New Zealand was further invited to take the chair at the inaugural meeting of Congress. His Excellency had replied that he wished the invitation to take the chair at the inaugural meeting to be repeated at a later date.

Letters of invitation had been addressed to the following gentlemen to become the Vice-Presidents of Congress:

#### Past Presidents of Congress:

Sir Joseph Verco.  
Sir Harry Allen.  
Dr. F. A. Pockley.  
Dr. A. C. Purchas.  
The Honourable W. F. Taylor.  
Sir George A. Syme.

#### Vice-Presidents of the British Medical Association:

Dr. W. T. Hayward, C.M.G.  
Dr. R. H. Todd.  
Dr. H. E. Gibbs.

#### Director of Naval Medical Services (Australia):

Surgeon Captain C. A. Gayer Phipps.

#### Director-General of Army Medical Services (Australia):

General G. W. Barber, C.B., C.M.G., D.S.O.

#### Director-General of Health of the Commonwealth:

Dr. J. H. L. Cumpston.

#### Director-General of Army Medical Services (New Zealand):

Colonel R. Tracy Inglis, C.B.E.

#### Director-General of Health of the Dominion of New Zealand:

Dr. T. H. A. Valentine.

Acceptances had been received from all except Dr. Purchas, whose reply had not been received by the time of the meeting.

#### Dates of Meetings.

A letter from Dr. Alfred Cox, the Medical Secretary of the British Medical Association, was read, informing the Federal Committee that the Council had given approval to the proposed amendment of the constitution of the Federal Committee in regard to the date of meetings.

It was therefore resolved to notify the Branches that Clause 4 (i.) had been altered to read:

- (i.) It shall meet at such times and places as it shall determine or in the absence of such determination as the Chairman shall direct. Provided that at least one meeting shall be held in the year not later than the last day of May.

#### Director-General of Army Medical Services.

At its meeting on August 26 and 27, 1925, the Committee had resolved to request the Minister for Defence to take the necessary steps to give the Director-General of Army Medical Services full control of his department with direct access to the members of the Military Board and to the Minister for Defence. In reply to a communication to this effect, the Minister has intimated that careful consideration had been given to the request of the Federal Committee; the present system worked efficiently and smoothly and no advantage would be gained by effecting any alteration. It was further pointed out that the Director-General had control over his department and had free and direct access to individual members of the Military Board and to the Minister through the Adjutant General. No further action was taken.

#### Uniform Conditions of Medical Services in Public Hospitals.

The consideration of the possibility of adopting a policy governing the conditions of medical service in public hospitals was continued from the last meeting. A memorandum had been received from the Victorian Branch comprising the decisions of the Legislative Subcommittee of the Council, a classification of the hospitals by the Charities Board (1924), the decisions of the Victorian Branch Council (1920-22), the results of a conference of the Council with representatives of voluntary hospitals and a report of the Legislative Subcommittee of the Victorian Branch on intermediate hospitals.

Dr. J. LOCKHART GIBSON announced that the Council of the Queensland Branch had adopted a report. With the sanction of the Committee he proceeded to read the report.



After discussion it was decided that in view of the immediate importance of the larger question of the adoption of a policy covering the medical services in all classes of hospitals, the Branches should be asked to consider Section 1 of the Queensland Branch report and further that information concerning the American hospital systems should be obtained and communicated to the Branches.

Section 1 of the Queensland Branch report reads as follows:

For the purpose of defining the policy of the Queensland Branch of the British Medical Association in regard to hospitals, patients may in general be divided into three classes: (a) Those able to pay neither hospital nor medical fees; (b) those able to pay full hospital and medical fees; (c) intermediate patients defined as those able to pay something toward their care and treatment, but not able to pay full private hospital or medical fees.

Of class (a) it may be said at the outset that they are entitled to free treatment on presenting themselves at a public hospital, either indoor or outdoor as their cases may require.

Class (b). These having paid hospital fees in full, should also pay the doctor full medical fees beyond the hospital charges.

Class (c). For these it is desirable that so far as possible special arrangements should be made in intermediate hospitals where they should pay for their maintenance in hospitals and such reduced medical fees as may be agreed upon between them and their medical attendants. Intermediate hospitals should be under different management to ordinary general hospitals.

With regard to (b) the Home Secretary's ruling to the effect that public hospitals are intended for the "necessitous sick" shall apply. The definition of the words "necessitous sick" with examples should be carefully drawn up for the managers of hospitals, whether committee or medical officers. In arriving at a decision re "necessitousness" it should be understood that statements by applicants for benefits of hospitals should, if designedly misleading, be punishable by law. The machinery of the Income Tax Department should be available.

Several members explained the systems obtaining in their respective States, more particularly in country and industrial districts. It was obvious that a great deal of useful information could be collected and it was therefore resolved:

That the Branches be asked to supply to the Federal Committee a full statement concerning the systems existing in the various hospitals in their respective States.

And that the available information be circulated among the Branches for opinion and report.

#### Industrial Hygiene Contracts.

The Honorary Secretary stated that the Branches had been asked to supply the terms and conditions of existing contracts between industrial firms or employers of labour and medical practitioners. He submitted a draft model agreement between industrial medical officers and companies or firms.

The draft model agreement was approved in the following form:

MEMORANDUM OF AGREEMENT made the.....day of.....One thousand nine hundred and twenty.....BETWEEN.....in the State of.....[hereinafter called the.....(Company or Firm)] of the one part and.....of.....Medical Practitioner (hereinafter called the Industrial Medical Officer) of the other part.

#### WHEREBY IT IS AGREED THAT

1. The said.....shall be the Industrial Medical Officer of the said.....for a term of six months commencing on the.....day of.....192.. and shall continue thereafter to hold such office until this agreement terminates either party being at liberty to determine the same by giving to the other one month's notice in writing.

2. The salary of the said Industrial Medical Officer shall be at the rate of.....per annum payable monthly on the.....day of each month the first payment to be made on the.....day of.....

3. The.....(Company or Firm).....shall supply all drugs dressings medical and surgical equipment office accommodation furniture stationery and office sundries requisite for the carrying out of the Industrial Medical Officer's duties.

4. The Industrial Medical Officer shall attend at the.....(Company's or Firm's).....(works factory place of business) at.....at the following times week by week namely—

	a.m.	to a.m.	to p.m.	to p.m.
Monday .. ..	.....	.....	.....	.....
Tuesday .. ..	.....	.....	.....	.....
Wednesday .. ..	.....	.....	.....	.....
Thursday .. ..	.....	.....	.....	.....
Friday .. ..	.....	.....	.....	.....

5. The duties of the Industrial Medical Officer shall include the following:

- (i.) The medical examination of applicants for employment.
- (ii.) The medical examination of employees at stated periods.
- (iii.) The medical examination of employees reported to be sick and the giving of certificates as to fitness of employees to resume work.
- (iv.) The immediate symptomatic treatment of employees taken ill or found to be suffering from indisposition at.....(works factory place of business).
- (v.) Immediate (first aid) medical attendance at the.....(works factory place of business).....upon employees injured by accident.
- (vi.) Periodical inspection of all buildings and working places with a view to the establishment and maintenance of a high standard of sanitation and hygiene.
- (vii.) The investigation of occupational diseases existing amongst employees and of their causes and remedies.
- (viii.) The supervision of First Aid Ambulance Work Rest Rooms Dental Clinics and Welfare arrangements generally. The specification of the duties of Nurses First Aid and Ambulance Attendants.
- (ix.) The advising of employees as to the observance of rules of health.

6. The Industrial Medical Officer shall keep proper records of all work done by him and shall periodically as required make reports upon the following matters together with any recommendations which he may think suitable namely—

- (a) The working conditions in their relation to the health of employees.
- (b) Sanitation and water supply.

- (c) The health of employees medically examined especially having regard to suitability of each employee's work to his or her physical condition.
- (d) The condition of persons injured at the ..... (works factory place of business).....stating as far as ascertainable the cause of such injury and making recommendations for the avoidance of future accidents.

7. The.....(Company or Firm).....shall pay to the Industrial Medical Officer his reasonable and proper fares and travelling expenses while travelling in the course of his duty.

AS WITNESS the Common Seal, etc.

It was resolved that the model form of agreement be sent to the Branches for consideration and that the Branches be requested to make suggestions concerning the rate of remuneration of industrial medical officers.

#### Report of the Royal Commission on Health.

The report of the Royal Commission on Health as printed in *THE MEDICAL JOURNAL OF AUSTRALIA* (January 16, 1926) was laid before the members. It was recognized that the Federal Committee could not consider the report in detail until the Branches had had an opportunity of studying it and instructing their representatives on the several points. Sir George Syme pointed out that many of the matters dealt with by the Commission had previously been before the Federal Committee. The Commission had been greatly assisted by this fact.

On the motion of Dr. J. ADAM DICK, seconded by Dr. W. N. ROBERTSON it was resolved:

That the Federal Government be asked to give the Federal Committee an opportunity of considering any proposals for legislation arising from the report of the Royal Commission on Health before they were submitted to Parliament.

#### Dichotomy.

The Honorary Secretary read a letter from the Victorian Branch inviting the Federal Committee to make a pronouncement in connexion with the ethical aspect of fee splitting. This letter had been submitted to the Branches and a reply had been received from the New South Wales Branch supporting the proposal that the Federal Committee should make a pronouncement in condemnation of the practice. Reference was made to a letter by Dr. Norman McArthur in *THE MEDICAL JOURNAL OF AUSTRALIA* of November 7, 1925, to a leading article in *THE MEDICAL JOURNAL OF AUSTRALIA* of December 5, 1925, entitled: "Dichotomy" and to correspondence which had been published in the journal.

The members agreed that it was essential to inform the profession that the practice of fee splitting was dishonourable and objectionable.

In the course of discussion the attention of the Committee was directed to a memorandum addressed by the Council of the New South Wales Branch to its members on the relative position of the medical attendant and the consultant, operating surgeon, pathologist, bacteriologist, radiologist or other specialist in respect to the patient or the patient's representative in the matter of fees.

The attention of the Council has, from time to time in recent years, been drawn to instances where a medical practitioner, who has arranged for a consultation to be held or a surgical operation to be performed or a report from a specialist to be obtained, has, contrary to the custom and traditions of the profession, claimed that the consultant or operating surgeon or specialist has been engaged not by the patient or his representative but by himself and that the fee for the service is a matter between him and the consultant operating surgeon or specialist as the case may be.

In some of the instances referred to, it has been alleged that the medical attendant received a larger fee for the service than he passed on to the consultant operating surgeon or specialist.

The Council understands that the legal position in regard to liability for the payment of a consultant's fees (and the same applies in all cases where arrangements have been made by a medical attendant for the services of another practitioner to be available for his patient) is that such liability is in the patient and not in the medical attendant by reason of an implied contract between the patient and the consultant; and that the medical attendant is the agent of the patient for the purpose of making such arrangements. Even in the case where, as sometimes happens, there is an agreement or contract between the patient and the medical attendant, that the latter (the medical attendant) shall engage the consultant and be responsible to the consultant for the payment of his fees, the patient is, nevertheless, liable in law to the consultant for his fees. If, however, the consultant is a party in any arrangement made with the patient intended to preclude him from looking to the patient for payment for his services, the patient is not liable for such payment.

In the case where the medical attendant omits to disclose to the other practitioner the patient's name and address, as may happen where the medical attendant sends a specimen to a pathologist for examination and report, the medical attendant is still the agent of the patient in the matter. He would, however, be responsible in law for the payment of the pathologist's fees by reason of the fact that he had not disclosed the principal's name.

The Council holds that the patient is entitled to a receipt from the consultant, operating surgeon or specialist for the money paid by him in every case where the money is received by such consultant, operating surgeon or specialist from the medical attendant.

Reference was made to paragraph 9 of the Ethical Principles adopted by the Federal Committee which reads as follows:

It is unethical for a member of the British Medical Association in Australia:

9. To divide fees with or give commissions to medical practitioners or layman.

It was moved by Dr. H. S. NEWLAND, seconded by Dr. J. LOCKHART GIBSON and resolved:

That Paragraph 9 of the Principles of Medical Ethics be confirmed and that the legal aspect be communicated to the Branches.

#### Date of Next Meeting.

It was resolved that the next meeting of the Federal Committee be held in Sydney at a date to be fixed by the Chairman.

#### Votes of Thanks.

A hearty vote of thanks was accorded to Sir George A. Syme for the admirable manner in which he conducted the business of the Committee and to the President and Council of the Victorian Branch for having provided accommodation for the Committee and for their hospitality.

#### Official Opening of the British Medical Association House.

Dr. W. N. ROBERTSON, C.B.E., reported that he had attended the official opening of the British Medical Association House in Tavistock Square, London, on July 13, 1925, at the invitation of the Federal Committee as representative of the Branches of the British Medical Association in Australia. On the same occasion he had presented the chair as a gift of the Branches of the British Medical Association in Australia. He spoke of the cordial welcome which he had received in his representative capacity. A full account of the proceedings had appeared in the *British Medical Journal* of July 18, 1925.

## SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the B.M.A. Buildings, 30 to 34, Elizabeth Street, Sydney, on November 26, 1925, Dr. R. B. WADE, the President, in the chair.

## Infantile Mortality.

Dr. P. L. HIPSLEY read a paper entitled: "Still-Births and Early Infantile Mortality" (see page 203).

Dr. MARGARET H. HARPER read a paper entitled: "Cause and Prevention of Mortality During the First Month of Life" (see page 207).

PROFESSOR A. E. MILLS congratulated both Dr. Harper and Dr. Hipsley on their very excellent papers. He thought that the best part of the papers was that containing the recommendations at the end. He had been particularly impressed by the quite unusual infusion of common sense in Dr. Hipsley's paper. His conclusions were logical and he had carried his audience with him. The causes of death of new-born and particularly of premature babies included hemorrhage, blood conditions leading to hemorrhage, toxæmias, such as syphilitic poisoning and infarcts of the placenta, leading to want of oxygen. Professor Mills was convinced that want of oxygen caused by mucus in the larynx of infants was very rare. At times the infant would not breathe. In these circumstances the respiratory centre seemed to be at fault. This might be brought about by hemorrhage or by increased intracranial pressure. When the respiratory centre was primarily affected, it was not a matter of defective development, but rather of want of nutrition. The cells from which motor impulses were discharged, were highly susceptible to want of oxygen. In premature infants in addition to the liability to want of oxygen on the part of the vital cells of the central nervous system, there was the problem of the maintenance of the body heat. Professor Mills stated that American authorities claimed that incubators were necessary for these weakly premature babies. It was hot in summer and cold in winter in the United States of America. In Australia, according to Dr. Harper, incubators were not essential. The whole problem was to preserve the body heat of these infants. If heat units were supplied and the child lost an excessive amount of heat, it could not carry on. Dr. Harper had dealt with many of the causes of dyspnoea and cyanosis in premature and weakly infants. He did not believe that the dyspnoea was produced by the weakness of the respiratory muscles. They would work satisfactorily when properly governed by the respiratory centre. The latter working at the highest pitch left little margin of safety. It required very little alteration to cause them to give out altogether.

PROFESSOR J. C. WINDEYER said that he was much impressed by the excellence of both papers. He was more interested in the subject of Dr. Hipsley's discourse. In regard to the toxæmic affections of infants he held that it was essential to withhold breast milk during the early postclimactic stage. The breasts should be emptied by means of the pump. They had adopted this practice at the Royal Hospital for Women with satisfactory results. The mother's blood contained toxins which seemed to be passed on through the milk to the infant. In speaking of hemorrhage, Professor Windeyer pointed out that in many instances sudden straining of the intracranial septa caused tears of these structures. This occurred during rapid extraction with the forceps and with rapid extraction of the after coming head. As tears of the septa also occurred in cases in which there was disproportion between the foetal head and the pelvis, most of them could be prevented by the timely induction of labour. In conclusion Professor Windeyer stated that small, premature infants who were otherwise normal, had a good chance of ultimate recovery. He always kept these premature infants in hospital until they could be transferred to "Tressillian."

Dr. HARVEY SUTTON, O.B.E., regarded Dr. Harper's and Dr. Hipsley's papers as most lucid and illuminating. They

were full of eminently practical suggestions. It was noteworthy that both authors were moving in the right direction by providing first hand observations of Australian conditions. Dr. Sutton mentioned that it had been stated that the erstwhile presentation could be detected in after life by the shape of the vertex. He was not prepared to substantiate this claim. In regard to the infantile mortality he thought that it was misleading to express the death rate during the first week of life in plain figures. For comparison it was essential to express the rate as an annual rate. Thus the rate of thirty deaths per thousand births occurring in the first week, should be multiplied by fifty-two to give the strict comparison with the infantile mortality rate for the first year of sixty-two per thousand births. The rate was an appalling one. In spite of the improvement in the mortality during the first year of life, the figures for the first week were somewhat higher than they had been twenty years previously. It appeared that the age of the mothers was of considerable moment in the determination of the maternal and probable infantile mortality. The mortality during childbearing of mothers between the ages of twenty and thirty-five years was 2.6 per thousand births; and that of mothers of thirty-five or over was 7.5 or about three times as great. The general health of the mothers in the broadest sense of the term was of real significance in this connexion. There were no available statistics or direct information in regard to the exact influence of the order in the family or the age of the mother at the time of the birth of the children, but he was satisfied that it was not a matter of whether the child was the first child or the fifth, but of the age of the mother at the time. The sex of the infant also had a distinct bearing on the infantile mortality. Female infants had a better chance than male infants in the proportion of 18:22 during the first week of life. Racial differences had also been indicated. In New York the mortality among the children of Russian mothers was 20 as compared with 35 for children of American mothers, 20 for children of Canadian mothers and 25 for children of Italian mothers. It seemed that large problems were involved and that extensive investigations would have to be undertaken. The question of the chances of life of illegitimate infants has also to be studied. Then there was the influence of the occupation of the mothers. It appeared that this influence was more in evidence in the old world than in Australia.

Dr. Sutton urged the official notification of all still-births and a concerted attempt to collect one thousand cases for exhaustive investigation in order to get near to the actual cause of death. Under existing conditions the usual death certification was useless. It was absurd to give congenital debility, marasmus and the like as causes of death without fuller investigation. Syphilis was often omitted from the certificates. He advocated confidential certification of the real cause of death, even if the general practitioner gave another certificate which the patients' relatives might see. This was analogous to the Swiss method of requiring a certificate for the purpose of authorizing burial. A second certificate was forwarded to the statistical authority setting forth the real cause of death. In conclusion Dr. Sutton referred to the influence of alcohol on infantile mortality. Experiments by Stockard had revealed the great rise in the death rate among the offsprings of guinea pigs poisoned with alcohol.

Dr. H. C. E. DONOVAN thanked Dr. Margaret Harper and Dr. Hipsley for their helpful papers. He doubted whether Cesarean section appreciably reduced foetal mortality in cases of *placenta previa*. McKerron, of Edinburgh, had shown that the infantile mortality in these circumstances was very high. Eardley Holland had dealt with the causes of death at and after birth. Death did not occur from anoxæmia due to pressure on the cord, but to anoxæmia, the result of intracranial pressure. The injury after difficult birth was rupture of the tentorium and pressure on the vital centres in the medulla. Fatal results frequently followed hasty delivery. The obstetrician should learn that he could take a longer time over the delivery with greater safety to the mother. In regard to the frequency of syphilis as a cause of infantile and foetal death, he



quoted Holland's statistics. In hospital practice 16% of still-born infants were syphilitic and the majority of these were macerated. Under ideal conditions it was probable that 56% of all deaths of infants during or immediately after birth could be prevented. Dr. Donovan was convinced that antenatal care would provide the solution of the problem. The movement had not been in existence for a sufficient time to affect the statistics. He maintained that external version should be performed for *placenta previa*.

DR. L. R. PARKER spoke of the experience of the staff at "Greycliffe" Home for Infants. The condition of the premature infants admitted to the home was rarely uncomplicated. Usually they had enteritis or some similar affection. This made the problem much more difficult of solution. Dr. Harper had told them that they did not use incubators at "Tressillian." At "Greycliffe" they had one and used it. They had a special room for premature infants in which the infants were kept warm by means of hot water bags and clothes. They were insistent on measures to prevent loss of heat by exposure of the head. For the purpose of cleaning premature infants benzoline and naphthaline had been used, but oil appeared to be sufficient. When enteritis was present, super-cleanliness was essential and then oil had proved insufficient. These infants were put into a bath, but the precaution of having the bath in front of a fire was necessary. They were kept but a short time in the bath and were then put back to bed, looking brighter and better. In regard to the feeding of these infants, human milk was undoubtedly the best food. As a rule they were able to procure human milk for the babies. If none were available, the best alternative was a mixture with whey as a basis. To the whey they added either cow's milk, "Lactogen" or even casein. Dr. Parker argued that the quantity of fluid provided was most important. It was essential to prevent undue loss of heat. By giving an excess of fluid, there would be an increased loss of heat by sweating and evaporation. It was therefore advisable to supply fluid just sufficient for the needs of the body. Excellent results were obtained by careful management; in fact there appeared to be little limit to the good that could be done. He cited two histories in support of his contentions. An infant was born prematurely. The authorities maintained that the infant was not viable and the claim for the maternity bonus was refused. With extreme care the child was kept alive and eventually it gained strength. After a long time it left the home and subsequently its recovery was complete. The authorities at a later date repented and paid the bonus. In the second instance twin infants were born at six months. The mother was suffering at the time from an acute gonorrhoeal cystitis. Her temperature rose to 40° C. (104° F.) and she had many rigors. One of the infants was still-born, but the second was alive. With care it survived, notwithstanding the fact that its weight at birth, including the diaper and singlet, was nine hundred grammes (two pounds). The devoted mother carried out the instructions in an intelligent manner and thanks to this the infant developed normally. Dr. Parker maintained that a careful mother could rear a premature infant, if properly instructed and guided. On the other hand he held that it was hazardous to guarantee the life of a weakly infant until it had passed the third month of life. Not infrequently these babies died suddenly without obvious cause. Before concluding Dr. Parker stated that contrary to the usual teaching he was convinced that it was not necessary to deliver the after-coming head in breech presentations within two or three minutes of the birth of the body of the baby.

DR. A. J. GIBSON referred to the statistics collected at the Crown Street Hospital for Women. Among 1,214 infants born, one hundred had died. Of this hundred, seventy-two had presented by the vertex, twenty-one by the breech, four had presented in the transverse position and of three the presentation had not been recorded. He held that twenty-one seemed an unduly high proportion of breech presentations, but over 50% of these were premature. He did not know the frequency among the general population. He agreed with Dr. Donovan that speed in delivery was inadvisable. In speaking of hæmorrhage

from *placenta previa* he cited a case to show that an infant could live for a considerable time after the separation of the placenta. In a case of central *placenta previa* he had taken fifteen minutes to deliver the child after completely removing the placenta. He had then attended to the mother and in the meantime the infant started to breathe. It had therefore survived for over fifteen minutes in the uterus after the complete separation of placenta. Unfortunately the child had died a few hours later. Of the hundred infants that had died, sixteen had been premature and thirteen had been macerated. In addition there were nineteen still-born, full-time infants. Two of the infants were monsters, in five instances the complication was *placenta previa* and in nine accidental hæmorrhage. Three of the mothers had had eclampsia and four albuminuria; in seven instrumental delivery had been necessary; one of the infants had been in a condition of pallid asphyxia. The fœtus had to be destroyed on five occasions. Dr. Gibson held that it was not usually realized how much could be achieved by skilled prenatal care. It was usually held that supervision was especially necessary in *primiparæ*. The fœtal mortality from posterior positions in *primiparæ* was nil, but in *multiparæ* eleven infants lost their lives. If these posterior positions had been converted into anterior positions before labour, the eleven babies might have been saved. He maintained that pituitrin applied rashly was the cause of the death of many babies. Instead of being in a hurry, the obstetrician should learn to wait, especially in the second and third stages. Thorough investigation into the causes of fœtal mortality at birth should be carried out. At the Crown Street Hospital they had applied for a pathologist on the honorary staff. None had applied. Eventually a pathologist had been engaged; he was paid reduced private fees. The need for economy in the hospital was evident, but he thought that in the interests of the patients adequate remuneration should be offered to a pathologist, in order that important investigations of this kind might be made.

DR. R. DICK agreed with Dr. Gibson concerning the need for a thorough investigation into the causes of still-birth and death during the first week of life. His department had already taken steps in this direction. Dr. E. S. Morris had prepared a *questionnaire* dealing with these subjects. He hoped that with the introduction of the new regulations under the *Nurses Registration Act*, with the improvement of obstetrical practice and with the revision of the midwifery curriculum at the University of Sydney, better conditions were in store. He expressed the opinion that the authorities should exercise generosity in providing hospitals with pathology departments.

DR. E. LUDOWICI referred to Dr. Sutton's inquiry as to the age of mothers in relation to infantile mortality. He stated that the size of infants tended to become larger in later pregnancies and with the inevitable wear and tear of life the mothers were less able to stand the strain of birth. He pointed out that they had to be careful in their acceptance of statistics. He strongly opposed the view that in the cases quoted by Dr. Gibson the cause of death was due to breech presentation. Death was probably due to causes which brought on premature labour, such as *ante partum* hæmorrhage and so forth. In these cases the infants were dead, moribund or not sufficiently developed to be capable of living. He eulogized the work carried out in the baby clinics called welfare centres and at "Tressillian" School for Mothercraft. He had been faced with much hostile criticism when he had fought for their establishment, but with Dr. Harper's assistance, they had met that criticism. The excellent results as shown by Dr. Harper's paper were sufficient justification for the stand they had taken.

DR. R. B. WADE thanked both speakers for their papers and said that the Branch was deeply indebted to them for their valuable and interesting contributions. He thought that Dr. Hipsley had been the first in Australia to give full statistical evidence in regard to the causes of death of young infants. He felt that they could not hope to progress with this work until they had opportunities for the collection of pathological information. It was essential that the obstetrical nurse should be trained in infant feeding by pædiatricians, not by obstetricians.

In closing the discussion Dr. Hipsley said that in regard to the criticism concerning the use of incubators, all that was essential was to have a room kept at a special temperature. It was justifiable to call this an incubator. He thanked his audience for their kindly reception of his paper.

DR. MARGARET HARPER thought that there was not much actual difference of opinion concerning the use of incubators. The main thing was to keep the babies in a warm, unvarying temperature.

#### NOMINATIONS AND ELECTIONS.

THE undermentioned has been nominated for election as a member of the New South Wales Branch of the British Medical Association:

Wiles, Charles Angus, M.B., Ch.M., 1925 (Univ. Sydney), 6, Moruben Road, Mosman.

### Correspondence.

#### THE ADMINISTRATION OF ETHER IN OPERATIONS OF THE LUNG.

SIR: I read with interest Dr. Lidwill's article on the administration of ether in operations of the lung in your current number, but I note that he underestimates the pressures used in intratracheal anaesthesia.

I agree that for ordinary cases a maximum blow off pressure of twenty-five millimetres of mercury is usually sufficient, but I would be distinctly unhappy if I thought that any of my operation cases were receiving the maximum pressure that Dr. Lidwill says he sometimes uses, namely forty millimetres of mercury. Thirty millimetres of mercury is what I look upon as the limit of safety.

Even twenty-five millimetres of mercury is no inconsiderable pressure, especially when it is applied for long periods. Dr. Lidwill says that this is equivalent to blowing air through a tube immersed in six inches (fifteen centimetres) of water. With a specific gravity of 1.36 for mercury this should be thirteen and a half inches. One has only to try the experiment to realize what a difference this is and if it is kept up for only a short while to see what a strain is thrown on the respiratory system.

To show that such moderate pressures are not without possibilities of danger, I will refer to a child from whom I was about to remove the tonsils by dissection. Too large an intratracheal catheter had been inserted and before the operation had commenced extreme cyanosis developed. As it was realized that the size of the catheter was causing the cyanosis by interfering with expiration, it was withdrawn. At once the patient's general condition gave rise to anxiety and the left pupil became widely dilated and fixed, but the cyanosis passed off. All thoughts of operation were abandoned. For several hours the child remained unconscious, but was practically well the next day. The pupillary dilatation also persisted some hours, but passed off during the night.

At the time I believed that a hæmorrhage due to the extreme asphyxia had occurred in the region of the left oculomotor nucleus, but the rapid recovery negatives this and I think proves that this was a case similar to caisson disease. Whilst the intrathoracic pressure was being kept above normal, excess of gases were being absorbed from the lungs, only to be liberated (in this case in the cerebral tissues) when the pressure was suddenly reduced to normal.

That such a small pressure can produce these results is, I think, a fact that should be widely known. On first thoughts one would not have thought them possible, especially when one considers that one can produce a positive intrathoracic pressure of eighty-seven millimetres of mercury on forced expiration with a closed glottis, whilst

divers have worked at pressures of over two metres of mercury. In the former case the pressure is kept up for very short periods only and in the latter decompression is performed very slowly. That is what makes the difference.

I do not wish my remarks to be taken as criticism of intratracheal anaesthesia. Far from it. The method is indispensable for work on the air passages where general anaesthesia is to be used and I look forward to the day when all the younger practitioners at least can use the necessary apparatus. Even in such a simple operation as dissection of tonsils I will not operate under general anaesthesia unless given by the intratracheal method. The operation is possible without, but it is an unfair risk to ask the patient to take.

Yours, etc.,

A. B. K. WATKINS.

Commercial Bank Chambers,  
Newcastle, New South Wales,  
December 20, 1925.

#### SINUSITIS AND COLLOIDAL MANGANESE.

SIR: Dr. Sydney Pern has made certain statements regarding the efficacy of colloidal manganese injections in the treatment of certain cases of nasal accessory sinusitis. I agree that certain cases are cleared up by the use of this drug.

For a number of years I have been using colloidal manganese in the treatment of these conditions and have come to the conclusion that in the majority of definite cases of chronic suppurative sinusitis this drug by itself is of little, if any, benefit. However, I have had considerable success in cases which are typical of that described by Dr. Pern, that is cases which show pus and mucopus in the nose and naso-pharynx and which suggest a condition frequently found following cases of acute "colds in the head"—colds which "hang on"—I find that generally in these cases the pus rapidly clears up following injections of colloidal manganese.

I think that we must distinguish between a transient pansinusitis which is the invariable accompaniment of "a cold in the head," and a chronic sinus infection of nasal origin in which there is obstruction to the ventilation of the sinuses.

I have had a fair number of cases which have not "cleared up" on washing out the sinuses, but which after one or two injections of colloidal manganese have rapidly improved.

I am convinced that the cases in which there is a definite middle turbinate obstruction, do not as a rule clear up, except those of mild infections above mentioned. If we use a classification depending upon this abnormal anatomical factor, I think we will come to a more definite line of treatment in these cases.

I think highly of the beneficial action of this drug and I use it (in conjunction with other aids) in all cases of suppuration in the sinuses and have found it most useful in clearing up "colds in the head" which have "hung on."

Yours, etc.,

R. GRAHAM BROWN.

Preston House, Queen Street,  
Brisbane,  
January 7, 1926.

#### A LIGHTNING FATALITY.

SIR: On the fourth instant at 3 p.m. a heavy thunder-storm passed over Kangaroo Valley. A party of telegraph linesmen were clearing trees and scrub on the side of a bush road and when the storm approached, three of them took shelter under a bloodwood tree (*Eucalyptus corymbosa*) which was about forty-five feet high with trunk eighteen inches diameter.

The tree was struck by lightning two-thirds of the way up, several boughs were splintered and much of the bark of the trunk was torn off down to a height of five feet from the ground. At this level large pieces of bark were missing and cracks in the underlying timber extended right through the trunk; there was no damage to the tree at a lower level.

Of the three men standing close together, V.T. was wearing trousers, socks and boots, D.R. trousers and boots and was in the act of removing his thick flannel shirt in order to save it getting wet. He had the shirt partly pulled over his head and was being helped by the third man, S.L., who was standing between his two mates and had hold of D.R. The two first named were killed instantly and fell full length on either side, while S.L. was sent "spinning round" and fell in the middle of the road some yards away. He soon recovered his senses, but is still suffering from considerable pain and stiffness of the neck and legs and has a small puncture in the right tympanic membrane. The whole happening was seen by two other men who had taken shelter under a newly fallen tree about ten yards away; these two are also suffering from headache and general shock. The points worth noting are:

(i.) Absence of the least sign of injury or burn on either of the deceased men or their clothing.

(ii.) The fact of the middle man being thrown clear.

(iii.) Absence of injury to the tree below a level corresponding to the shoulders of the men, showing that the electricity had left the tree and passed through the men and yet although it had severely damaged a good sized tree, apparently was able to pass through the men and their boots without leaving a mark.

(iv.) The million to one chance of that particular tree being struck, as it was part of the forest with no clearing around, except the road some yards away. Nor was it by any means the tallest tree at that spot and there was no metal of any sort against it. The only metal the men had were axes and they had been left some distance away.

I noted that *rigor mortis* did not set in.

Yours, etc.,

F. A. RODWAY.

Nowra, New South Wales.

January 7, 1926.

#### TREATMENT OF BOILS.

SIR: May I crave permission to ask through your columns for advice from fellow practitioners regarding the prophylactic and active treatment of the ordinary boil? To attempt to bring such a despised and commonplace lesion into the realm of discussion seems, I admit, to be rather an untoward procedure. And yet I have been encouraged to do so after contemplating the enormous variety of treatments recommended in textbooks and elsewhere, practically all of which appear to be of little actual value.

The writer is convinced that the time-honoured custom of incision, particularly if the boil is not "ripe" (as is often the case) is probably the worst procedure of all. In the earlier stages the effect of incision is usually to make the boil "angrier" and to spread the area of subcutaneous induration. In the later stages when much pus with fluctuation is present very little advantage results as the pus would be evacuated normally by Nature in a short time. And unless the incision is a long one, necessitating usually general anaesthesia, no help will be obtained from it in the subsequent extraction of the core. With regard to the necessity for extraction of the core the writer has not found a greater number of recurrences after non-extraction than after extraction. In any case the core is very rarely wholly extracted by the suction bell, hot bottle or any other method.

The writer has had personal experience of boils on his face recently and also two years ago. He has tried on himself and on patients, both private and hospital, most of the treatments recommended in the textbooks and a number more. To prevent recurrence colloidal manganese injections, autogenous and stock vaccines, reduction of

carbohydrate intake, mineralization of the tissues, tonics *et cetera*. To prevent the development of a boil in its commencing stages *tinctura iodi*, ichthyol ointment (15%), continuous medicated and unmedicated fomentos over many hours, ichthyol-glycerine applications (up to 50%), saturated solutions of magnesium sulphate as a foment; also the hypodermic injection of a large dose of stock vaccine. He has not submitted any to X ray treatment. In the interval between the disappearance of one boil and the appearance of another he has applied spirituous biniodide, one in one thousand, to his face and neck daily (his complexion being such that he could ignore entirely what might have been the effect upon it). He has also smeared the whole face and neck with *unguentum hydrargyri nitratis dilutum* in an attempt to mortify the staphylococci. In spite of all his endeavours and in spite also of the fact that he is in excellent health generally and has just completed a course of colloidal manganese injections (six injections of one cubic centimetre each at three day intervals) he has just experienced the inconvenience of another medium-sized boil on the chin.

The only successful procedure (and its success is mainly in the relief of pain and in making the patient feel comfortable) seems to be the removal of a small circular piece from the centre of the boil with a sharp scalpel under general anaesthesia and the making of two or four radial incisions outwards from this. Long before pus has formed this will give the patient great relief and will eventually reduce the severity of the lesion. But to have to give a general anaesthetic for each of a succession of boils is far too drastic treatment for the usual patient to tolerate either financially or physically.

To sum up: What the writer would be gratified to know is, firstly, is it possible to actually stop a boil developing when it is first discovered as a small angry pimple? Secondly, is there any absolute way of preventing the appearance of further boils in a patient who has had, say, two? And, thirdly, how would your readers treat a moderately large sized boil of the cheek (where cosmetic considerations enter the question) which is in a stage some time before any fluctuation has appeared?

One ventures to suggest that an adequate solution of questions such as these would be of more use to practitioners and of infinitely greater value to patients generally than would a profound discussion upon, say, methods of removal of the Gasserian ganglion, for whereas one patient suffers from intractable trigeminal neuralgia, ten thousand suffer from boils.

Yours, etc.,

GILBERT G. BRADLEY.

Northbridge, Sydney,

January 4, 1926.

#### INFANTILE MORTALITY.

SIR: Time and the lateness of the hour prevented me from commenting on Dr. Gibson's remarks as to the facilities for pathological work at the Women's Hospital, Crown Street. There is as a matter of fact ample provision made for such work. A small laboratory is provided for the use of the resident medical officers; the services of the microbiological laboratory (by the courtesy of the Health Department) and of a pathologist in private practice can be freely utilized. It is interesting to note that although on several occasions the Board has advertised for the services of an honorary pathologist, no applications were forthcoming.

It was then decided on the recommendation of the Honorary Medical Staff that in certain cases the services of a private pathologist would be available, fees at a reduced rate being arranged. True it is that the financial officers of a hospital stress the necessity for economy, but this must be taken as a natural part of their office. No doctor need allow himself to be influenced in the slightest degree, where the necessity of the case demands the employment of the private pathologist. Personally the arrangement has been quite successful.



Any further investigations depend upon the enthusiasm of the honorary medical officer who naturally should direct such. He has to assist him the facilities already mentioned. Consideration of room and difference of opinion amongst the members of the Honorary Medical Staff as to the advisability of establishing a large laboratory in close proximity to lying-in wards have debarred the employment of a laboratory attendant for the hack work which necessarily would be checked by a fully qualified pathologist. Extensions of the hospital in the near future will overcome this difficulty.

As regards cases demanding prompt reports and the visits of a pathologist to the hospital, there is a good deal to be said for the present system of payment according to the nature and amount of work done.

Yours, etc.,  
E. LUDOWICKI.

Honorary Surgeon, The Women's Hospital.  
Sydney, February 13, 1926.

### Books Received.

- THE STUDENT'S POCKET PRESCRIBER AND GUIDE TO PRESCRIPTION WRITING, by David Mitchell MacDonald, M.D., F.R.C.P.E.; Ninth Edition; 1925. Edinburgh: E. and S. Livingstone. Med. 32mo., pp. 227.
- REPRODUCTION IN THE RABBIT, by John Hammond, M.A. (Cantab.), with Foreword and Chapter on the formation of the *Corpus Luteum*, by F. H. A. Marshall, F.R.S.; 1925. Edinburgh: Oliver and Boyd. Demy 8vo., pp. 210 with illustrations. Price: 15s. net.
- THE CATECHISM SERIES: MEDICAL BACTERIOLOGY AND PROTOZOOLOGY, by W. R. Logan, M.D., F.R.C.P.E.; Third Edition, Part I. and II.; 1925. Edinburgh: E. and S. Livingstone. Crown 8vo., pp. 178. Price: 1s. 6d. net.
- THE CATECHISM SERIES: MIDWIFERY. Part II; Third Edition; 1925. Edinburgh: E. and S. Livingstone. Crown 8vo., pp. 70. Price: 1s. 6d. net.
- THE CATECHISM SERIES: DISEASES OF THE EYE, by William George Sym, M.D., F.R.C.S.E.; Second Edition; 1925. Edinburgh: E. and S. Livingstone. Crown 8vo., pp. 68. Price: 1s. 6d. net.
- LIFE AND LETTERS OF WALTER H. PAGE, by Burton J. Hendrick; Second Series containing the letters to Woodrow Wilson; 1925. Australia: Cornstalk Publishing Company. Sydney: Angus and Robertson, Limited. Demy 8vo., pp. 456 with illustrations. Price: 16s. net.
- THE CLINICAL STUDY AND TREATMENT OF SICK CHILDREN, by John Thomson, M.D., LL.D., F.R.C.P. (Edinburgh); Fourth Edition, Rewritten and Enlarged; 1925. Edinburgh: Oliver and Boyd. Royal 8vo., pp. 919 with illustrations. Price: 30s. net.
- MANIPULATIVE SURGERY: PRINCIPLES AND PRACTICE, by A. G. Timbrell Fisher, M.C., F.R.C.S. (England); 1925. London: H. K. Lewis and Company, Limited. Demy 8vo., pp. 176 with illustrations. Price: 7s. 6d. net.
- WHAT TO DO IN CASES OF POISONING, by William Murrell, M.D., F.R.C.P.; Thirteenth Edition Revised by P. Hamill, M.D., D.Sc., F.R.C.P.; 1925. London: H. K. Lewis and Company, Limited. Royal 32mo. pp. 282. Price: 4s. 6d. net.
- THE THERAPY OF PUERPERAL FEVER, by Privatdozent Dr. Robert Koehler; American Edition prepared by Hugh Ehrenfest, M.D., F.A.C.S.; 1925. St. Louis: The C. V. Mosby Company. Royal 8vo., pp. 276, with illustrations. Price: \$4.00 net.

### Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xx.

ROYAL HOSPITAL FOR WOMEN, PADDINGTON: Junior Resident Medical Officer.

ROYAL NORTH SHORE HOSPITAL OF SYDNEY, OPHTHALMIC DEPARTMENT: Honorary Clinical Assistant.

SAINT VINCENT'S HOSPITAL, MELBOURNE: Honorary Physician to Out-Patients, Honorary Dermatologist (2), Honorary Ophthalmic Surgeon, Honorary Anaesthetist (2), Medical Clinical Assistant, Surgical Clinical Assistant.

THE UNIVERSITY OF MELBOURNE: Stewart Scholarship in Surgery.

WESTERN AUSTRALIAN PUBLIC SERVICE: Medical Officer of Schools.

### Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmalm United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association. Proprietary, Limited. Mutual National Provident Club. National Provident Association.
QUEENSLAND: Honorary Secretary B.M.A. Building, Adelaide Street, Brisbane.	Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Honorary Secretary, 12, North Terrace, Adelaide.	Contract Practice Appointments at Ceduna, Wudinna (Central Eyre's Peninsula), Murat Bay and other West Coast of South Australia Districts.
WESTERN AUSTRALIAN: Honorary Secretary, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

### Diary for the Month.

- FEB. 23.—New South Wales Branch, B.M.A.: Medical Politics Committee.
- FEB. 24.—Victorian Branch, B.M.A.: Council.
- FEB. 25.—South Australian Branch, B.M.A.: Branch.
- MAR. 2.—Tasmanian Branch, B.M.A.: Council.
- MAR. 2.—New South Wales Branch, B.M.A.: Ethics Committee.
- MAR. 3.—Victorian Branch, B.M.A.: Branch.
- MAR. 3.—Western Australian Branch, B.M.A.: Council.
- MAR. 4.—South Australian Branch, B.M.A.: Council.
- MAR. 5.—Queensland Branch, B.M.A.: Branch.
- MAR. 9.—Tasmanian Branch, B.M.A.: Branch.
- MAR. 9.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
- MAR. 11.—Victorian Branch, B.M.A.: Council.
- MAR. 12.—Queensland Branch, B.M.A.: Council.
- MAR. 15.—New South Wales Branch, B.M.A.: Organization and Science Committee.
- MAR. 16.—Tasmanian Branch, B.M.A.: Council.
- MAR. 16.—New South Wales Branch, B.M.A.: Medical Politics Committee.
- MAR. 17.—Western Australian Branch, B.M.A.: Branch.

### Editorial Notices.

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All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

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